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Fractures About the Knee Joint

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and Charles A. Owen, Jr., M.D., Rochester, Minn.....

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CASE PRESENTATIONS

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Roger P. Hallin, M.D., and Vernon A. Vix, M.D.,
Worthington, Minnesota.....

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Original Contributions

Abdominal Aortic Aneurysms

Considerations in Diagnosis and Management

EUGENE F. BERNSTEIN, M.D.

ALAN P. THAL, M.D.

RICHARD L. VARCO, M.D.

Minneapolis, Minnesota

THE development of effective methods of surgical treatment of abdominal aortic aneurysms during the past six years has transformed a disease which virtually had been an incurable medicopathologic curiosity into a surgical lesion of increasing importance. Treatment of these lesions by resection and graft has progressed from a period of experimental trial at a few university medical centers to one of widespread acceptance on many active surgical services.

Additional importance must be attached to this condition because of its absolute increase in incidence over the past few decades. Maniglia and Gregory¹ have shown that in recent years the number of thoracic aortic aneurysms has diminished considerably, while aneurysms of the abdominal aorta have become more frequent. In like manner, the ratio of arteriosclerotic to syphilitic aneurysms has increased from 1:8 (1906-1931) to 1:0.4 (1949-1951). Recent studies by Estes² and others^{3,4,5,6} have confirmed the almost uniformly arteriosclerotic origin of abdominal aortic aneurysms being seen currently.

This change in etiology and incidence must be attributed to (1) the marked decrease in the incidence of late stages of syphilis and (2) the increase in the aged population, and coincident increase in arteriosclerosis and its complications. It would appear that a continued increase in the incidence of this disease must be expected in the future.

Historical Review of Surgical Treatment

The origin of the surgical attack on arterial aneurysms is centuries old. As early as 400 A.D., a surgeon named Antyllus⁷ operated on aneurysms of the head and extremities, using a method known

From the Department of Surgery, University of Minnesota Medical School, Minneapolis 14, Minnesota. Dr. Thal is an Established Investigator, American Heart Association.

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as "aneurismotomy." Between two ligatures, he opened and evacuated these aneurysms, but did not actually excise them. Other early surgical attacks on peripheral aneurysms include the "methode of Purmann,"⁸ in which the extirpation of peripheral aneurysms was described in 1680, and Anel's⁹ principle of placing a ligature proximal to the dilatation in 1710.

Further refinements of the Anel method were added by John Hunter in 1785. He attempted to tie the artery some distance proximal to the aneurysm, where the vessel was more likely to be healthy. Thus, he ligated the femoral artery for popliteal aneurysms in "Hunter's canal." Unfortunately, this procedure, and its later modification by Scarpa (1819) in which the artery was ligated in "Scarpa's triangle," often led to gangrene and loss of the extremity.

The first recorded clinical description of an abdominal aortic aneurysm is that of Vesalius in 1567.¹⁰ In 1719, Valisneri¹⁰ described a traumatic abdominal aortic aneurysm, and the first attempt at its surgical treatment: an "unskillful surgeon" lanced the tumor. Brasdor, in 1798, ligated the main trunk of the aorta *distal* to an aneurysm, close to the lesion. However, the patient did not survive.

The first recorded ligation of the aorta *proximal* to an aneurysm was the heroic procedure of Sir Astley Cooper in 1817,¹¹ in which he used this method to treat a ruptured aneurysm of the left ileofemoral region. Unfortunately, the patient succumbed forty hours postoperatively (Fig. 1).

Other principles of aneurysm control were proposed in the nineteenth century. Pasquin suggested the double ligature, both above and below the sac. However, in some of his cases the collateral circulation to the sac continued to feed the aneurysm. Wardrop, in 1825, advocated ligating *one* branch distal to aneurysms of the common carotid, subclavian and innominate arteries. Still later, in

1857, Syme described a method of incising the sac without controlling ligatures around the vessel, plugging the entrance to the aneurysm with a finger. Occasional successful results were reported in the treatment of peripheral aneurysms by all of these methods, but it was not until the latter half of the nineteenth century that success in treating abdominal aortic aneurysms was first described.

Osler¹⁰ reports a case treated by Murray in 1863 in which compression above the sac was used to successfully treat an aneurysm of the abdominal aorta in one patient for six years. Unfortunately, the method of compression is not described.

A landmark in aneurysm treatment was reached in 1864, when Moore¹² first introduced wire into an aneurysm to induce thrombus formation. He passed 78 feet of wire into an aneurysm of the ascending aorta; the patient lived for five days before succumbing to generalized sepsis. A valuable addition to this form of treatment was made by Corradi and Buressi, in 1879, when they passed an electric current through the wire in an aneurysm to further encourage thrombus formation.

Another important contribution to aneurysm treatment was described in 1888, when Matas⁸ reported treating a traumatic aneurysm of the brachial artery by obliteration of the dead space by suture, after removing the thrombus, while preserving the aneurysm wall and its collaterals. This principle of "endoaneurysmorrhaphy" was later refined into obliterative, restorative and reconstructive types, with variations in technique designed to preserve the main arterial channel in saccular and fusiform lesions. However, it was not used for an aneurysm of the abdominal aorta until Lozano's unsuccessful case in 1906, and not successfully until Bigger's case¹³ in 1938.

With the turn of the century, interest in vascular conditions increased in many surgical clinics and a number of interesting items were reported in the surgical literature. Perhaps the most important, and certainly the most forward-looking, was Carrel's series of experiments¹⁴ in vascular surgery and the use of arterial and venous autografts and homografts which began in 1901.

Sporadic reports of attacks on aortic aneurysms also became somewhat more common. In 1890 Milton unsuccessfully ligated the abdominal aorta proximal to an aneurysm of the abdominal aorta, for the first time. In 1899, Keen ligated the aorta above the renals for a large abdominal aortic aneurysm with survival of the patient for forty-

eight days. Tuffier¹⁵ reported the ligation of the sac of a saccular aneurysm of the ascending aorta, with the death of the patient in thirteen days, due to hemorrhage secondary to infection and gangrene of the sac—the forerunner of present-day discussion concerning the necessity for the removal of the aneurysm sac whenever possible.

Halsted became interested in the problem, and in 1905 published a report¹⁶ on the treatment of two patients with a gradually occluding aluminum band applied to the aorta proximal to the aneurysm. In 1912, Finney and Halsted¹⁷ reported twenty-three cases (eighteen of their own) which had been treated by wiring, and, in some cases, the injection of gelatin. The wire was passed through a hollow needle, which was introduced into the aneurysm percutaneously. Two of their cases survived for over one year.

Other successful cases treated by ligation of the aorta were reported. The first successful ligation of the aorta *distal* to an abdominal aortic aneurysm was reported by Vaughn in 1920,¹⁸ the patient surviving over sixteen months. In 1923, Matas¹⁹ reported the seventeen-month survival of a twenty-three-year-old Negress treated by ligation of the aorta *proximal* to an abdominal aneurysm.

Blakemore²⁰ revived interest in wiring with coagulation in 1938, a cause he was to champion for fifteen years. In the same year, Bigger¹³ reported his case, previously alluded to, in which he first ligated the aorta proximal to an aneurysm with fascia lata, and then performed an aneurysmorrhaphy a month later, with a two-year survival. The following year Elkin²¹ reported the successful treatment of a case with partial occlusion of the aorta with cotton tape.

A new type of treatment was heralded by Page's use of cellophane to produce hypertension by wrapping the kidneys in 1939. DeTakats,²² who treated three cases with ligation of the aorta proximal to the aneurysm with a 1 in. wide cellophane band, used a sheet of cellophane to wrap the aneurysm in one case which was threatening to perforate. Other materials used to wrap aneurysms, in an effort to prevent rupture, include Lowenberg's use of cutis²³ in two cases in 1950 and Wylie's introduction of fascia lata as a wrap in 1951.²⁴

The development of practical methods for the preservation and use of human aortic homografts by Gross in 1948^{25,26} was a large step towards the present methods of treatment of aortic aneurysms.

Three years later, Dubost reported the first case of excision and graft of an abdominal aortic aneurysm,²⁷ with re-establishment of continuity by an aortic homograft. This patient lived for at least three years following surgery.²⁸

In 1953, Bahnson²⁹ described the successful

degeneration of this biologically variable material. For these reasons, a number of synthetic prostheses have been introduced and are currently being evaluated as aortic replacement materials.

With increasing experience there has been a general acceptance of resection and graft as the

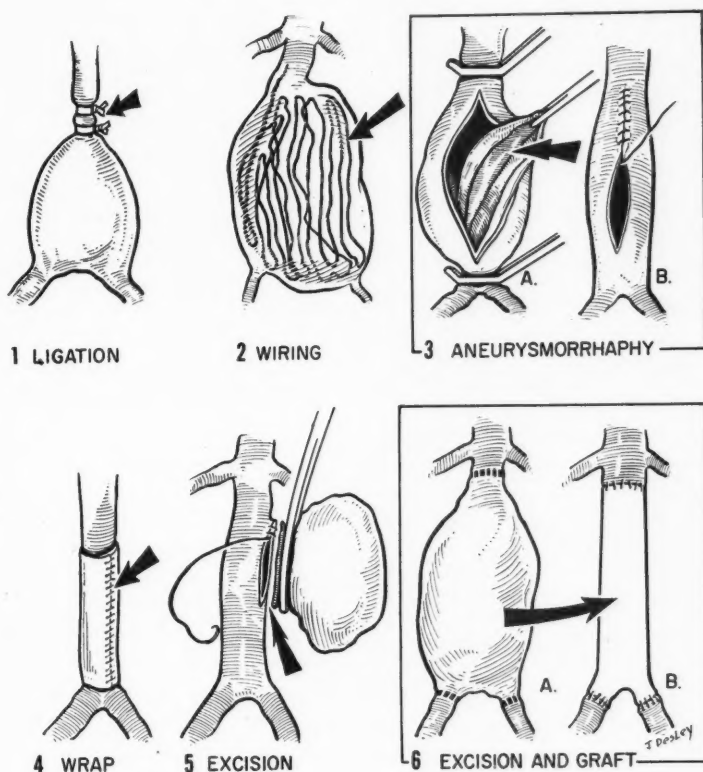


Fig. 1. Historical development of methods of treatment of aneurysms of the abdominal aorta.

treatment of saccular aneurysms of the thoracic and abdominal aorta by excision of the aneurysms with suture of the aortic wall. However, in the same year, the superiority of the Dubost method, and its uniform applicability to fusiform and saccular aneurysms, was indicated by the first American report of successful resection and graft of abdominal aortic aneurysms, by DeBakey and Cooley.³⁰ Interestingly enough, only one of their first seven cases died of uremia, and two of the cases were failures of polythene wrapping.

The initial success of the homograft as a replacement material was quickly followed by a series of technical difficulties in the supply, sterilization, preservation and, most important, late

treatment of choice for abdominal aortic aneurysms, and with this acceptance, a gradual decrease in surgical mortality has been accompanied by consequent improvement in over-all survival.

Diagnosis

A great majority of these lesions can be diagnosed on the basis of history and physical examination alone. Approximately three-fourths of the patients will be males, and five-sixths will be over sixty years old. Of ninety-one cases seen at the University of Minnesota Hospitals from 1948 to 1957, sixty-nine were men and seventy-nine were over sixty years old (Table I).

Over half of the patients complained of some

ABDOMINAL AORTIC ANEURYSMS—BERNSTEIN ET AL

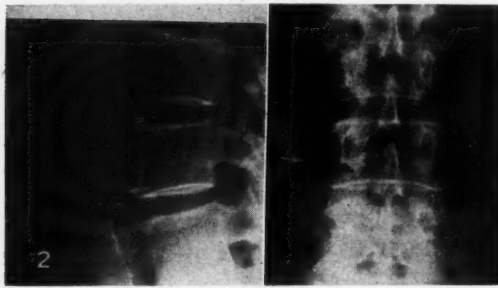


Fig. 2. Flat plate and lateral films of the abdomen demonstrating calcification in the wall of an aneurysm. Both walls can be seen in the lateral view.

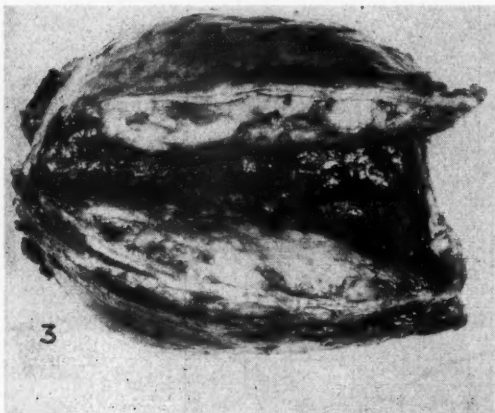


Fig. 3. Specimen of an aortic aneurysm demonstrating the thick walls and relatively normal aortic channel.

type of vague abdominal pain—usually epigastric and not very severe. Severe pain, or a sudden increase in pain, in a patient with a palpable, pulsatile abdominal mass indicates rupture or imminent rupture of the aneurysm. In luetic aneurysms, severe pain is often indicative of vertebral erosion. However, vertebral erosion is rarely seen in arteriosclerotic aneurysms. None of our cases had evidence of lues, although serological tests for syphilis were not performed in all cases.

A palpable, expansile, pulsatile, abdominal mass, usually in the epigastrium and frequently to the left of the midline, is present in 80 per cent of the cases. However, ectasia of the aorta may simulate aneurysm. Indeed, five cases have been explored at this hospital in the past nine months in which a preoperative diagnosis of abdominal aneurysm based on physical findings was in error.

Further, twenty of the cases seen during the past ten years were entirely asymptomatic, and discovered during the course of medical care or hos-

TABLE I. ABDOMINAL AORTIC ANEURYSMS

1948-1957 (91 Cases)		
Age	Male	Female
40-49	3	0
50-59	8	1
60-69	31	8
70-79	18	9
80-89	8	4
90-99	1	0
Total	69	22
Associated Diseases		
Hypertension (over 140/90).....		(56%) 51
Myocardial infarction		16
Cerebrovascular accidents		5
EKG with BBB.....		2
Ulcer		6
Cancer		8
Symptoms		
Sudden onset of abdominal pain, ruptured aneurysm.....		8
Abdominal pain, with palpable pulsatile abdominal mass.....		51
No pain; patient felt a pulsatile mass.....		13
No symptoms—Discovered at postmortem.....		6
Discovered at physical examination.....		4
Discovered on x-ray.....		1
Discovered at laparotomy.....		9
Radiology		
Aortographic demonstration		27
Calcification on plain film.....		25
Neither		39

pital admission for unrelated conditions or at post-mortem. Nine of these cases were discovered at laparotomy performed with the intention of treating other conditions. It is, therefore, apparent that physical findings are not diagnostic in all cases and that other aids may occasionally be necessary and helpful.

Where the diagnosis is questionable, considerable aid can be obtained from various roentgenological techniques. Many cases, particularly those of long-standing, reveal calcification of the abdominal aorta on supine and lateral films of the abdomen (Fig. 2). In our series, twenty-five of the ninety-one cases demonstrated calcification in this manner. In addition, other studies which can be undertaken in an effort to diagnose an abdominal mass, such as a gastrointestinal series, barium enema, or intravenous urogram, may reveal the presence of a posterior abdominal mass, suggestive of aneurysm.

As previously mentioned, vertebral erosion is only rarely seen at present. Older reports²⁹ indicate that 75 per cent of syphilitic aortic aneurysms developed vertebral erosion, with preservation of the intervertebral discs. Bahnson²⁹ believes that arteriosclerotic aneurysms usually develop following eccentric dilation, elongation and thinning of the entire circumference of the vessel. Elongation pushes the aorta forward and away from the vertebral bodies and nerve roots, and in the absence of localized rupture, or saccular aneurysm, there is no vertebral erosion or root pain.

Aortography is unnecessary, except for the occasional cases in which the diagnosis is in doubt. Moreover, the occasional complication of trans-

genologist is careful to look for both sides of the aorta when calcification is present on the flat plate or lateral. In difficult cases, aortography may be

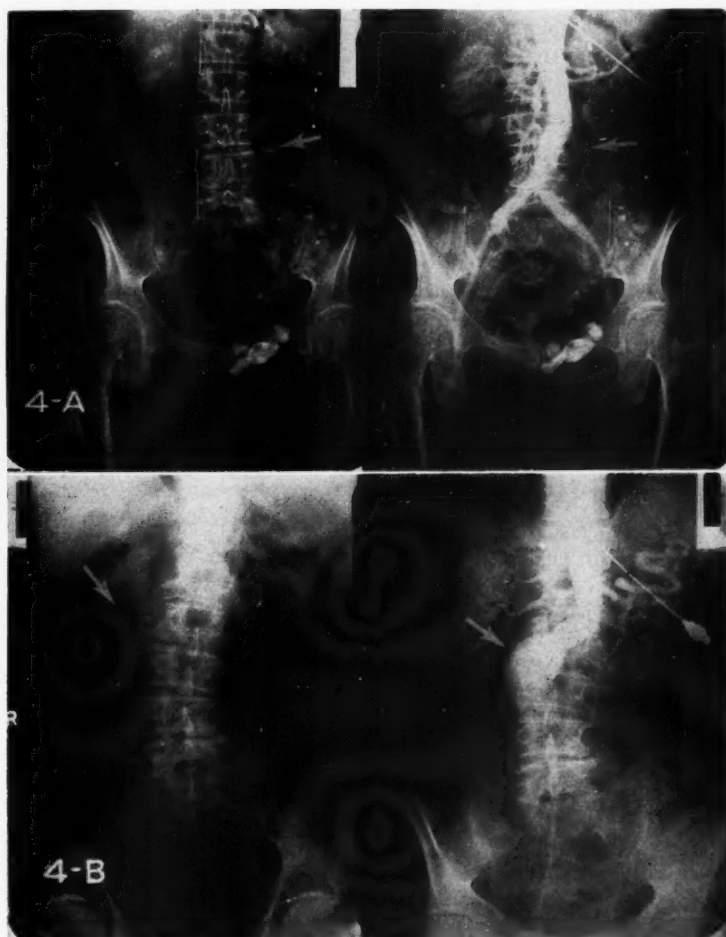


Fig. 4. (a) Flat plate demonstrates calcification, but the aortogram shows only ectasia. Most of the aneurysm is filled with thrombus. (b) Most commonly the aortogram clearly shows the aneurysm, if there is calcification in the wall, but it is unnecessary in making the diagnosis.

lumbar aortography^{31,32} makes it an unwise procedure unless the diagnosis cannot be made by other means. In addition, aortography may be misleading in aneurysms since the great bulk of the aneurysm contains laminated clot and frequently there is a normal-sized aortic channel running through the aneurysmal area (Fig. 3). For this reason, a normal aortogram does not rule out the presence of an aortic aneurysm (Fig. 4).

False diagnoses of aneurysm of the abdominal aorta can be ruled out in some cases if the roent-

helpful in differentiating between the ectatic and aneurysmal aorta.

Ruptured aneurysms usually present with sudden, severe abdominal pain which is frequently accompanied by shock and the development of an abdominal mass of increasing size. Fortunately, rupture is most common posteriorly into the retroperitoneal space, and more frequently to the left than to the right. Free rupture into the peritoneal cavity is a relatively rare condition which is almost always quickly fatal. In one case of free

rupture of an aneurysm into the peritoneal cavity which occurred while the patient was being prepared for elective surgery at this hospital, almost immediate laparotomy failed to prevent the patient's death. In the more common retroperitoneal perforations, however, there is a period of hours to a few days in which surgical therapy may be successfully instituted in most cases.

Occasional cases of rupture into the gastrointestinal tract have been described in the literature, most commonly into the duodenum.³³ However, none of our cases has had this complication.

Large arteriosclerotic aneurysms of the abdominal aorta occasionally do extend cephalad to involve the renal, superior mesenteric and coeliac arteries. However, of the cases in this series that were operated upon or seen at postmortem, none was found to involve these major visceral branches.

Management

1. *Selection of Cases for Surgery.*—Some authors feel that surgery should be denied certain patients with abdominal aortic aneurysms for various reasons. Bahnson³⁴ indicates that he operates on all patients who are not older than sixty-five and are in relatively good condition. In older patients with symptoms he recommends (but does not urge) surgery. Other authors feel that the presence of congestive heart failure, recent myocardial infarction, severe renal disease, or other lethal disease, constitutes a contraindication to surgery. DeBakey,³⁵ on the basis of his wide experience, feels that surgery should not be denied any patient with an aortic aneurysm solely on the basis of age. In his series, the mortality rate for patients over seventy-five years old was 17.5 per cent. Whereas this is greater than the elective mortality rate for younger patients in his hands, he feels that the lethality of the disease makes it acceptable. DeBakey considers the average case of aortic aneurysm a surgical emergency of greater priority than malignancy.

2. *Preoperative Preparation.*—In addition to the normal preoperative studies, a careful evaluation of the renal status of the patient should be obtained. In addition, the patient should have a standard antibiotic bowel preparation prior to surgery.

3. *Operative Technique.*—The details of the operative approach, dissection and reconstruction have been well described in other publications, and

need not be discussed here. Only a few pertinent points will therefore be considered.

The use of Arfonad to lower the blood pressure prior to cross-clamping the aorta does not appear to be of value despite the optimistic reports of Julian³⁶ and Powers.³⁷ Indeed, the three operative deaths in elective cases in our series in 1957 were all patients in whom Arfonad had been administered. In two of these cases, Arfonad must be implicated as at least a major contributor to the lethal end-result.

Sacrifice of the inferior mesenteric artery may be performed regularly.

Extra-corporeal circulation may be used in difficult cases, particularly those involving the renal arteries and/or coeliac axis.³⁸

Technically, the most difficult part of the procedure is usually involved in the dissection of the aneurysmal sac from the inferior vena cava. Some authors, such as Julian,⁴⁰ feel that with fixation of the sac to the inferior vena cava, it is sometimes wiser to permit that portion of the sac to remain in the abdomen, than to risk laceration of the wall of the vena cava. Most writers agree, however, that the risk of subsequent infection demands the removal of the sac, even at the risk of tearing the cava.

Heparin in doses of 30 to 40 mgs. is injected into the distal aortic tree just prior to cross-clamping. No heparin is given postoperatively, however, and no other postoperative anticoagulants are considered advisable.

A complete discussion of replacement prostheses currently available will not be undertaken here. Recent studies such as those of Szilagyi,³⁹ Barnes,⁴⁰ and others, have indicated that the incidence of early and late rupture and degeneration of homografts make them relatively undesirable replacement materials. Recent work seems to indicate the relative advantages of Teflon^{41,42,43} and Dacron over other synthetic materials. DeBakey's experience in which he has used knitted, crimped Dacron as a vascular substitute in 350 cases over the past year indicates that it is certainly a satisfactory substitute. Some evidence has recently appeared in literature concerning the thrombogenic qualities of Ivalon as compared with other synthetics, and this has been confirmed in the present series by two deaths secondary to thrombosis in Ivalon grafts. At this clinic, Teflon is the prosthetic currently in use for all aortic replacements.

4. *Postoperative Care.*—Aside from normal

postoperative procedures, only the careful observation of the patient's renal status and frequent observation of the presence of peripheral pulses must be added.

Results of Treatment by Resection and Graft

Of the various collected series of untreated cases of abdominal aortic aneurysms which have been

TABLE II.
UNTREATED ABDOMINAL AORTIC ANEURYSMS

Author	Estes ²	Wright ³	Others ^{2, 4, 6, 45, 46}
Number cases	102	107	337
Per cent ruptured	63%	13%	41%
Hypertension	40%	50%	46%
1-year survival	67%	39%	18%
2-year survival	58%	29%	
5-year survival	19%	4%	

TABLE III. ABDOMINAL AORTIC ANEURYSMS RESECTION AND GRAFT

Authors	Hospital	Year	No. Cases	Non-Ruptured Mortality	Ruptured Mortality	Over-All Mortality
DeBakey, Cooley, Creech ⁴⁵	Baylor	1957	230	8%	33%	11%
Barnes, Ellis, Kirklin ⁴⁶	Mayo	1958	78	14.8%	25%	15.4%
Bahpton ⁴⁴	Hopkins	1956	57	12%	86%	21.1%
Roberts, Danielson, Blakemore ⁴⁷	Univ. Pennsylvania	1957	30	18%	75%	36%
Wheelock, Shaw ⁴⁸	Massachusetts General	1956	19	0	60%	15.8%
Szilagy ⁴⁹	Henry Ford	1955	15	20%	None	20%
Bosher, Decker ⁵⁰	Med. Coll. Virginia	1957	13	22%	50%	32.3%
Hardin ⁴¹	Kansas	1957	18	20%	75%	27.7%
Bernstein et al	Univ. Minnesota	1958	46	13.2%	75%	24.0%

published recently, the studies of Estes² appear to be the most authoritative and most easily understood (Table II). In this series of 102 cases, 33 per cent of the patients were dead within one year of the time of the diagnosis and only 18.9 per cent were alive at the end of five years. The cause of death is known in forty-nine of the sixty-four patients who died, and in 63.3 per cent of these the cause of death was rupture of the aneurysm. In other series, the incidence of death due to rupture of the aneurysm averages approximately 40 per cent. The one-year survival is often quoted as less than that given by Estes, varying from 17 to 39.7 per cent in three other recent series. These statistics of the normal course of the disease, as well as the normal death rate for patients in this age group, as given by Estes, must be taken into consideration in evaluating the results of surgical treatment.

As indicated in Table III, the operative mortality for elective resection and graft of abdominal aortic aneurysms varies from 8 to 22 per cent, generally decreasing as the experience of a particular surgeon or institution increases. The mortality for cases of ruptured aneurysm is much higher, of course, but it must be remembered that these cases would all die within a short time without surgery.

It is still too early for a comparison of Estes' non-treated series with a sizable, statistically significant, long-term follow-up of treated cases. However, the survival figures reported by DeBakey and his group indicate a gratifying increase in life expectancy in the treated patients. Based on fifty-

one cases, they obtained a two-year survival rate of 72 per cent (Estes—58 per cent) and, based on sixteen cases, a three-year survival rate of 69 per cent (Estes—49 per cent). Although this series is still small, these results are certainly encouraging.

Of the fifty-seven cases of abdominal aortic aneurysm seen at this hospital during the past two years, all have been considered for resection, with the exception of those three discovered at post-mortem. It is felt that this group can be contrasted with the thirty-four cases seen in the previous eight years, in which sixteen were not operated on, two were explored alone, thirteen underwent aneurysmorrhaphy or wrapping or some combination of both, and three patients (1955) were subjected to resection and graft, with eventual fatal results in all three (Table IV).

Of the cases seen in the past two years, nine were not operated on, three were discovered at post-mortem, and the other six either refused surgery or were considered inoperable for cardiac, renal or other contraindications. Three additional patients were found to have abdominal aortic aneurysms on exploration and had no surgical treatment for this condition. One of these was found to have inoperable metastatic cancer, another had a bleeding duodenal ulcer which was treated by subtotal gastrectomy and in the third patient the distal vessels were too poor to suture. All three of these patients have subsequently died.

Three patients were treated by aneurysmorrhaphy, with one death. In this patient a femoral by-pass and sympathectomy had been performed, following which both legs became pulseless. Im-

ABDOMINAL AORTIC ANEURYSMS—BERNSTEIN ET AL

TABLE IV. ABDOMINAL AORTIC ANEURYSMS

1948-1955	Total	Known Dead	Known Alive	Average Survival Time (Mos.) Alive/Dead
Not operated on	10	15	1*	48+/20
Explored only	2	2	0	0/0.5
Aneurysmorrhaphy or wrap	13	9	4	52+/24
Resection—Elective	2	2	0	0/8
Ruptured	1	1	0	0/0
Totals	34	29	5	
1956-1957				
Not operated on	9	9†	0	0/3.2
Explored only	3	3	0	0/5
Aneurysmorrhaphy	3	1	2	7+/0
Resection—Elective	36	7	29	11+/7
Ruptured	6	4	2	14+/0
Totals	57	24	33	

*Operated on elsewhere in 1955.

†1 patient operated on in 1958.

mediate laporotomy revealed an aortic aneurysm with thrombosis. Despite the removal of the thrombus, retrograde flushing of both popliteals, and aneurysmorrhaphy, the patient died the following day, having re-thrombosed his abdominal aorta. The other two patients are doing well, fourteen and four months post-operatively.

The remaining thirty-six patients having non-ruptured aneurysms were treated by resection and graft, and will be combined with the two cases treated in this manner in 1955 to present our total experience with this method of treatment.

There were five operative deaths for an immediate mortality of 13.2 per cent. All five deaths occurred in patients over seventy years of age. In two of these cases, thrombosis of Ivalon prostheses was noted, and in one, frank rupture of the middle of a homograft resulted in death, although an attempt to replace this graft with a new one was undertaken. In the other two cases, as previously mentioned, Arfonad must be implicated as an important factor in the mortality.

Of the thirty-eight cases, eighteen were replaced by homografts, nine by Ivalon grafts, three by Ivalon plus nylon grafts, six by Edwards-Tapp nylon, one by Teflon, and one by a combination of Edwards-Tapp nylon and homograft.

TABLE VI. RUPTURED ABDOMINAL AORTIC ANEURYSMS
1955-1957

No.	Age	Preoperative Status	Operation	Result	Cause of Death
1	62	Acute shock	Ivalon graft	Died 7 days po	Uremia
2	71	Rupture in UMH	Ivalon patch	Died 2 days po	Hemorrhage
3	57	Acute shock	Homograft	Died 7 days po	Uremia; myocardial infarct
4	71	Acute shock	Homograft	O.K. 13 months	
5	68	Ivalon wrap 8 months before; rupture in UMH	Resected, no graft	Died in operating room	Cardiac arrest
6	74	Shock 3 days	Homograft	Died day of surgery	Hemorrhage
7	63	Shock 1 day	Ivalon-nylon	O.K. 9 months	
8	69	Free peritoneal rupture	Homograft	Died day of surgery	Hemorrhage; myocardial infarct

TABLE V. ABDOMINAL AORTIC ANEURYSMS
1955-1957
Elective Resection and Graft

	1955	1956	1957	Totals
Number of cases	2	17	19	38
Operative deaths	1	1	3	5 (13.2%)
Late deaths	1	2	1	4
Alive over 1 year	1*	15†	2	18
Alive less than 1 year	0	0	13	13

Mortality Record

No.	Age	Year	Cause of Death
Operative			
1	71	1955	Thrombosis of Ivalon graft, 6 wks. p.o.
2	77	1956	Rupture of homograft, 20 days p.o.
3	73	1957	Arfonad thrombosis of Ivalon graft, 4 days p.o.
4	71	1957	Arfonad, day of surgery
5	84	1957	Arfonad, day of surgery
Late			
1	67	1955	Metastatic CA colon, 15 mos. p.o.
2	86	1956	Mesenteric thrombosis, 20 mos. p.o.
3	64	1956	Unknown, 6 mos. p.o.
4	49	1957	Probable rupture of graft, 5 mos. p.o.

*Died 15 mos. postop.

†Died 20 mos. postop.

§Includes 2 late deaths.

In twenty-five cases only a straight graft was used. In eleven cases, a bifurcation replacement was necessary, and in three others the bifurcation was resected, but the common iliac arteries could be sewn together and only a straight replacement graft was necessary.

As Table V indicates, there have been four late deaths in this group, two of these patients surviving over one year following surgery. The remainder of the patients have all been contacted recently, are alive and without evidence of recurrence.

Of the eight cases of ruptured aneurysms which have been operated on, there have been only two survivors (Table VI). In this group (aside from the technical factors involved at surgery) the most common complication leading to death postoperatively was renal failure. The two survivors have lived thirteen and nine months respectively. However, one has subsequently been hospitalized for other complications of his widespread arteriosclerosis.

Comparison of the two groups (1948-1955 and 1956-1957) indicates the extent of improvement in salvage from this disease (Table IV). Of the thirty-four patients in the earlier group, all have been followed, and twenty-nine are known to be dead. Of the more recent series of fifty-seven cases, all of whom have been followed, thirty-three are alive following surgery and twenty-four are known dead. Advanced age (over seventy), rupture, hypertension and associated cardiac and renal disease are the most common factors leading to the death of these patients.

It is apparent that there is still considerable room for improvement. However, it must be noted that rupture of the aneurysm was responsible for the death of only seven of the nineteen patients who died during the past two years, as contrasted with the generally accepted figure of 40 per cent of deaths by rupture given in the literature. Further, the generally severe arteriosclerotic process, as well as other serious diseases of the aged, make this group of patients subject to a high death rate from other unrelated causes. Further follow-up of these and additional cases over a longer period of time will be necessary before a complete and reliable evaluation of the increase in survival as a result of resectional surgery can be attempted.

Renal Factors in Surgical Failures

A review of the eleven cases in this series which did not survive the immediate postoperative period indicated that the incidence of renal disease in these patients was considerably higher than might be expected. In addition, the recent studies of Thurlbeck and Castleman,⁴⁴ implicating cholesterol emboli to the kidneys as a prime cause of death following cross-clamping of the aorta below the renal arteries, led us to become interested in studying the available renal pathological material from these cases.

Advanced nephrosclerosis with extensive glomerular hyalinization and intimal proliferation of the arcuate and smaller arteries was present in eight of these eleven autopsied patients. Milder changes were seen in the remainder. Two cases showed cholesterol embolization (Fig. 5). The common occurrence of chronic severe renal disease in these patients with pronounced aortic atherosclerosis accounts for the high incidence of transient or prolonged postoperative renal insufficiency. Indeed, of the four patients dying several

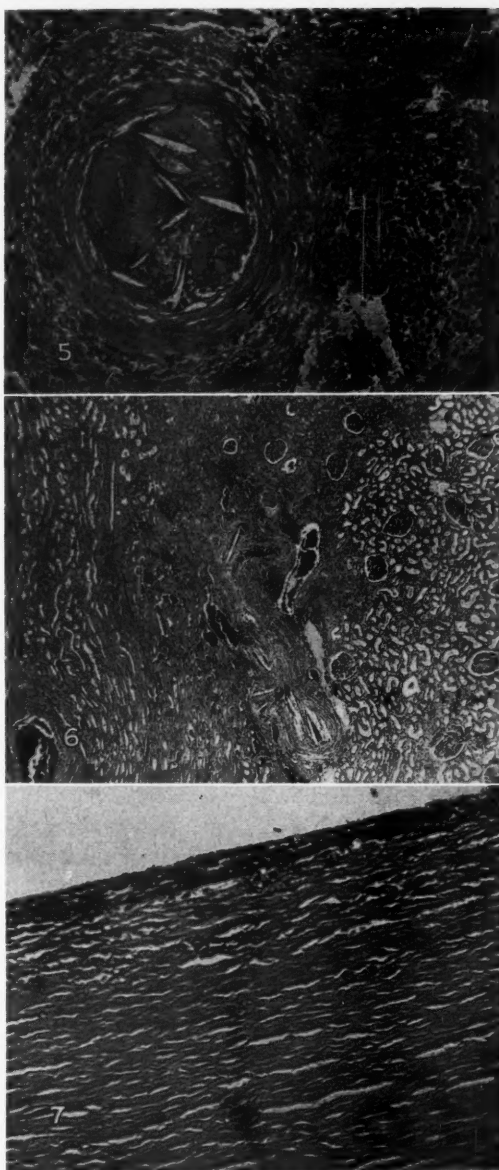


Fig. 5. Recent cholesterol embolus in small renal artery occurring on the day of surgery.

Fig. 6. Old cholesterol embolus in subcortical renal artery. Note wedge-shaped healed infarct of the cortex.

Fig. 7. Homograft from patient who died twenty months after surgery. The media is composed of condensed uninvaded elastic tissue. The neointima is thin and unstable.

days subsequent to surgery, three exhibited anuria or severe oliguria.

Tissue Reactions to Vessel Prostheses

The ideal substitute for the resected aorta would be readily embodied in the host tissue.

This would involve interstitial infiltration by living host connective tissue and the development of a vascularized stable intima. A study of various substitutes recovered after several months from a

perience at the University of Minnesota Hospitals has been compared with that of other institutions.

It appears that surgical treatment of aneurysms of the abdominal aorta by resection and graft in

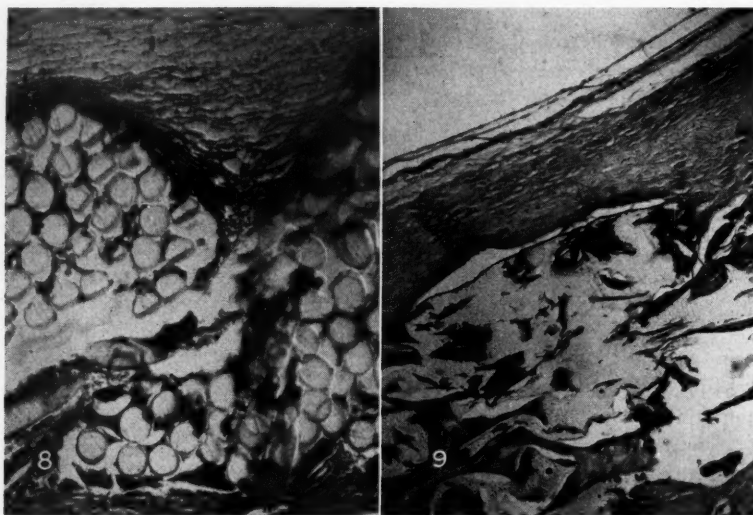


Fig. 8. Edwards-Tapp Nylon prosthesis removed three months after grafting. There is inadequate invasion by host connective tissue and thrombosis in the crimped area.

Fig. 9. Ivalon prosthesis at four months. Strands of connective tissue are seen invading between the interstices of the material. The new intimal layer is thickened but viable.

few of our patients reveals that this ideal has yet to be attained. Sections from a homograft twenty months after operation show that the media persists as an unvascularized homogenous tube of condensed and sometimes fragmented elastic tissue (Fig. 7). This neointima is only a few cells thick, unstable and constantly undergoing superficial ulceration and thrombosis. The situation in the human atherosclerotic patient differs from that in the experimental animal for in the former instance the host intima is itself ulcerated and replaced by atheroma and this does not serve as a donor for endothelial invasion of the homograft to the extent seen in the animal. Similarly, the nylon and ivalon prostheses (Figs. 8 and 9) showed irregular host invasion with the formation of an unstable intima in many areas. The newer materials such as teflon and dacron were not available for this study.

Summary

A discussion of the etiology, pathogenesis, diagnosis and management of aneurysms of the abdominal aorta has been undertaken. The ex-

non-ruptured cases may be undertaken with an expected mortality of less than 15 per cent. This must be contrasted with the attrition rate of 33 per cent in the first year for patients with this disease who remain untreated.

Until further long-term studies are available, it would appear that resection and graft is the treatment of choice for aneurysms of the abdominal aorta in patients of all ages, unless serious cardiac or renal contra-indications exist.

Technical factors, previous renal disease, and the use of Arfonad have been implicated as the major causes of death following aortic surgery at this institution.

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Evaluation of Conventional Roentgenologic Methods in the Study of Congenital Heart Disease

• In about 80 per cent of patients with congenital cardiac disease, an accurate determination of the type of malformation and an adequate prediction of the result of operation can be made by correlation of the clinical history, physical examination, electrocardiographic evidence and conventional x-ray studies of the chest. Drs. Vickers and Kincaid discuss the pertinent conventional roentgenologic findings.

CHARLES W. VICKERS, M.D.
OWINGS W. KINCAID, M.D.

Rochester, Minnesota

OPEN CARDIOTOMY by means of extracorporeal circulation has made possible the surgical correction of virtually all the more common forms of congenital malformations of the heart and great vessels. This increase in the scope of operable heart disease demands greater specificity in the evaluation of the individual patient. This evaluation includes accurate determination of the type of malformation present and prediction of whether correction of the malfor-

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Dr. Vickers is a Fellow in Radiology, Mayo Foundation, and Dr. Kincaid is from the Section of Roentgenology, Mayo Clinic, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

mation will result in improvement or deterioration of the cardiac status. The information obtained from the clinical history, a careful physical examination, an electrocardiogram, a conventional roentgenogram of the thorax, and roentgenoscopic examination of the heart is sufficient to answer these questions in about 80 per cent of cases. Of the remaining cases, the necessary information may be obtained by cardiac catheterization in about 10 per cent and by cardiac catheterization and angiocardiology in the remaining 10 per cent.

It is the purpose of this paper to discuss some of the problems and capabilities of the roentgenologist in the interpretation of the findings by conventional roentgenologic methods in operable congenital diseases of the heart and great vessels.

MINNESOTA MEDICINE

General Roentgenologic Criteria

Few signs that are manifested roentgenologically are, as isolated findings, unequivocally diagnostic

cycle at the time of exposure, and that in congenital heart disease one cannot even be certain that two ventricles are functionally and ana-

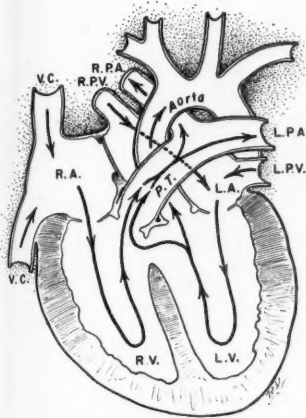


Fig. 1. Ventricular septal defect. If a pressure gradient is maintained between the ventricles, there is a left-to-right shunt through the defect from the high-pressure chamber (left ventricle) to the relatively low-pressure chamber (right ventricle). (Reproduced with permission from Edwards, J. E.: *Congenital malformations of the heart and great vessels*. In Gould, S. E.: *Pathology of the Heart*. Springfield, Illinois: Charles C Thomas, 1953, pp. 266-503.)

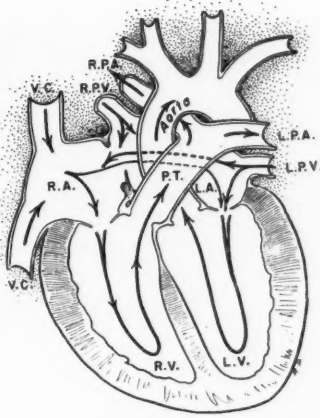


Fig. 2. Atrial septal defect. The left-to-right shunt through the defect is not dependent upon a pressure gradient but upon the differences in distensibility of the thick-walled left ventricle and the thinner-walled right ventricle. (Reproduced with permission from Edwards, J. E.: *Congenital malformations of the heart and great vessels*. In Gould, S. E.: *Pathology of the Heart*. Springfield, Illinois: Charles C Thomas, 1953, pp. 266-503.)

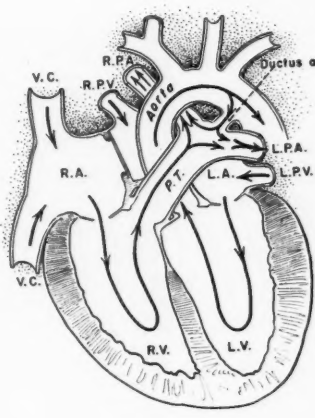


Fig. 3. Patent ductus arteriosus. The left-to-right flow through the persistent ductus arteriosus is a reflection of the pressure gradient between the aorta and the main pulmonary artery. (Reproduced with permission from Edwards, J. E.: *Congenital malformations of the heart and great vessels*. In Gould, S. E.: *Pathology of the Heart*. Springfield, Illinois: Charles C Thomas, 1953, pp. 266-503.)

of a specific malformation of the heart or great vessels. The worth of the roentgenologic interpretation in the evaluation of these malformations, therefore, lies in noting certain pertinent features that may be evident roentgenologically. These features are the general cardiac configuration, the transverse diameter of the heart (as estimated by the cardiothoracic ratio), the appearance of the main pulmonary artery and its central and peripheral branches, the size and configuration of the aortic arch, the size of the left atrium, and notching of the inferior borders of the ribs.

Much has appeared in the literature in recent years describing subtle changes in the cardiac contour and transverse diameter of the heart as being indicative of specific ventricular enlargement. When one is reminded, however, that the size and contour of the heart vary considerably with posture, age and phase of the respiratory

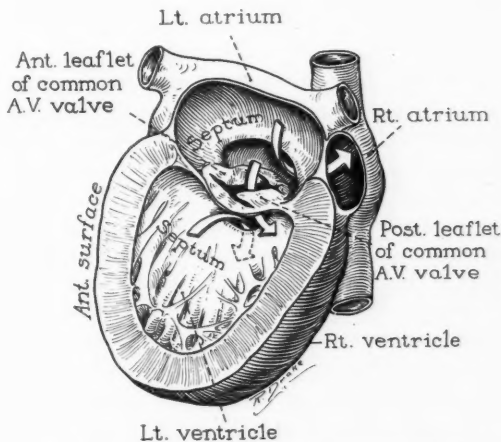


Fig. 4. Persistent common atrioventricular canal. All chambers of the heart are in communication. The magnitude of the left-to-right shunt is limited only by the magnitude of the pulmonary resistance. (Reproduced with permission from Rogers, H. M. and Edwards, J. E.: *Incomplete division of the atrioventricular canal with patent interatrial foramen primum (persistent common atrioventricular ostium)*: Report of five cases and review of the literature. *Am. Heart J.*, 36:28-54 [July] 1948.)

tomically present, it becomes evident that these criteria are of little value in the diagnosis of congenital heart disease.

artery. Patent ductus arteriosus produces a somewhat different picture in that the aortic arch is usually normal in size and may be bulbous in ap-

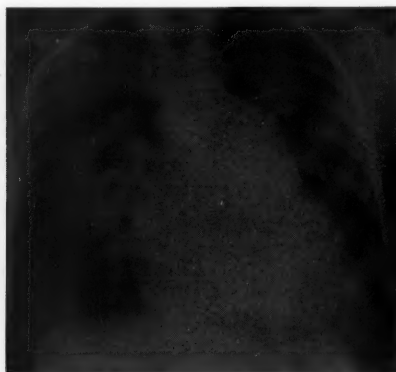


Fig. 5. Ventricular septal defect. There is a large flow in the pulmonary artery as manifested by large peripheral pulmonary arteries, hilar arteries, and main pulmonary artery. As a result of the diastolic overload of the left ventricle produced by this increased pulmonary flow, the left ventricle is enlarged. The left ventricular enlargement is manifested by an increase in the transverse diameter of the heart. The hilar arteries were found to pulsate vigorously. The size of the aortic arch cannot be evaluated.



Fig. 6. Patent ductus arteriosus. There is little evidence of increased flow in the pulmonary artery but the hilar arteries and the main pulmonary arteries are slightly enlarged. The hilar arteries were found to pulsate normally. The aortic arch is bulbous.

Anomalies Characterized by Left-to-Right Shunt

A large group of cardiac anomalies may be considered together since the hemodynamic alterations are similar in that they are characterized by an arteriovenous or left-to-right shunt and therefore have similar roentgenologic features. This group includes ventricular septal defect (Fig. 1), atrial septal defect (Fig. 2), patent ductus arteriosus (Fig. 3), persistent common atrioventricular canal (Fig. 4) and anomalous pulmonary venous connection. The roentgen characteristic of these malformations is increase in the size of the main pulmonary artery and its central and peripheral branches as evidence of increased flow in the pulmonary artery. There are no distinctive differences roentgenologically between ventricular septal defect, atrial septal defect and persistent common atrioventricular canal. In addition to signs of increased flow in the pulmonary artery, these three conditions are commonly associated with a hypoplastic aortic arch and vigorously pulsating branches of the pulmonary

artery, and since the abnormal flow of blood from the systemic to the lesser circulation occurs during both systole and diastole the branches of the pulmonary artery are less enlarged and pulsate more normally than in the intracardiac defects. In patent ductus arteriosus the left atrium is found to be enlarged in about 8 per cent of cases. Such enlargement is seldom if ever noted in the intracardiac defects. In about 50 per cent of cases the radiologist may be able to suggest a distinction between patent ductus arteriosus and the intracardiac defects on the basis of these differentiating features (Figs. 5 and 6).

Perhaps of even more value than a definitive roentgenologic diagnosis in the group with arteriovenous shunt is the information contributed by the roentgenologist in establishing the decision of operability in the individual patient. Operability in cases of ventricular septal defect and, less frequently, in patent ductus arteriosus and atrial septal defect depends to a very large extent upon the presence or absence of increased flow in

the pulmonary artery. Pulmonary arterial hypertension in ventricular septal defect, which is the most common congenital cardiac anomaly to produce pulmonary hypertension, may be due to

disastrous; pressure in the pulmonary trunk remains elevated and, with closure of the defect, the entire load is placed upon the right ventricle which may then fail.



Fig. 7. Ventricular septal defect. The pressure in the pulmonary artery was equal to systemic pressure before and after surgical repair of the defect. There is increase in size of the hilar arteries and the main pulmonary artery with no increase in size of peripheral pulmonary arteries. This is suggestive of increased pulmonary vascular resistance. At operation the right ventricle was found to be tremendously enlarged; but the transverse diameter of the heart is not increased. The aortic arch is hypoplastic.



Fig. 8. Atrial septal defect. The pressure in the main pulmonary artery was equal to systemic pressure. The main pulmonary artery and hilar arteries are greatly enlarged and the peripheral arteries are normal. This appearance is consistent with pulmonary hypertension resulting from increased pulmonary vascular resistance. The aortic arch is small to normal. The heart is not enlarged in the transverse diameter.

increased peripheral pulmonary vascular resistance or just to increase in the volume and velocity of blood in the pulmonary circulation without increased peripheral pulmonary vascular resistance. In either situation, pressure in the pulmonary trunk may be equal to the systemic pressure. It is apparent, then, that increased pressure in the pulmonary trunk in association with greatly increased flow therein indicates that closure of the defect will result in a substantial decrease in the pulmonary arterial hypertension and the heart will be, anatomically and physiologically, virtually normal. If, however, pulmonary hypertension is found to be associated with no increase of flow in the pulmonary trunk, it may be assumed that the pulmonary hypertension is secondary to greatly increased pulmonary resistance which is, for all practical purposes, irreversible. Closure of the defect in this situation produces no beneficial result, but rather may be

It is seldom necessary to resort to cardiac catheterization to determine operability in ventricular septal defect. The presence or absence of increased flow in the pulmonary artery may be established in the majority of cases by clinical, electrocardiographic and roentgenologic methods. Roentgenologically, the observation of enlargement of the main pulmonary artery and its central and peripheral branches is indicative of a greatly increased flow in the pulmonary artery (Fig. 5). If the main pulmonary artery and the central branches are very large and the arteries in the peripheral pulmonary fields are of small or normal size, it is reasonable to assume that there is little increase of flow in the pulmonary artery and that pulmonary arterial hypertension is present as a result of increased pulmonary resistance (Figs. 7 and 8).

The size and configuration of the heart is also important in helping to determine operability. In

a series of 115 patients who had been operated upon for correction of ventricular septal defect, the appearance of the heart at the time of operation was noted by the surgeon. It was evident

fect that have produced this characteristic change in cardiac size and contour are not present in atrial septal defect, since it is not associated with a diastolic overload of the left ventricle



Fig. 9. Tetralogy of Fallot. Right-sided aortic arch. Coeur-en-sabot configuration. At operation a large flow through the bronchial arteries was observed. The random disorderly arrangement of the vascular markings, especially in the left lung, is due to the ectatic bronchial arteries.



Fig. 10. Isolated pulmonary valvular and infundibular stenosis. There is post-stenotic dilatation of the main pulmonary artery, and the left pulmonary artery is larger than the right.

that in patients with increased flow in the pulmonary artery the left ventricle was enlarged. This occurs because of the diastolic overload of that chamber in this particular condition. The enlargement was manifested by encroachment of the heart on the left pulmonary field, and not infrequently the left border of the heart was against the left lateral wall of the thorax. The hypertrophied right ventricle did not contribute to this increase in the transverse diameter of the heart. In the few surgically treated patients in whom there was no increase of flow in the pulmonary artery the left ventricle was not enlarged, and although the right ventricle was greatly hypertrophied there was no increase in the transverse diameter of the heart. It may be assumed, then, that increase in the transverse diameter of the heart with projection to the left in patients with ventricular septal defect is an indication of left ventricular enlargement and is therefore another roentgen sign of increased flow in the pulmonary artery (Figs. 5 and 7). The unique hemodynamic alterations in ventricular septal de-

unless a large right-to-left shunt exists. The situation also differs in patent ductus arteriosus in that the left ventricle is usually enlarged in the presence of either increased or decreased flow in the pulmonary artery, and the right ventricle enlarges only as a result of severe hypertension in the pulmonary artery. It must be assumed, then, that this sign relative to cardiac size and contour is of no importance in the evaluation of conditions other than ventricular septal defect.

Anomalies Characterized by Pulmonary Stenosis

The other large group of cardiac anomalies that have gained importance since they are now surgically correctable are those that are characterized by varying degrees of pulmonary stenosis. The most common of these are pulmonary stenosis with ventricular septal defect or tetralogy of Fallot, and isolated pulmonary stenosis which may or may not be associated with atrial septal defect. Both of these conditions are said to be characterized by a decrease in pulmonary vascularity. This finding is actually noted, however,

change in only about 15 per cent of patients with tetralogy and in about 50 per cent with isolated pulmonary stenosis. In the majority, pulmonary vascularity appears to be normal and in a small

there is an associated patent ductus arteriosus. A large collateral circulation through the bronchial arteries may produce a bizarre appearance of the peripheral pulmonary fields, in which the

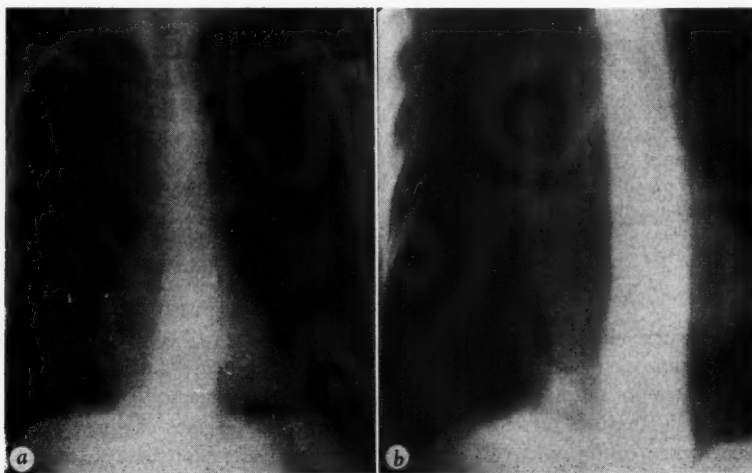


Fig. 11. Anomalous venous drainage of the right lung into the inferior vena cava. In the conventional roentgenogram (a) the anomalous vein may be seen along the right cardiac border. The tomogram (b) of this area demonstrates the anomalous vein and its major tributaries from all segments of the right lung.

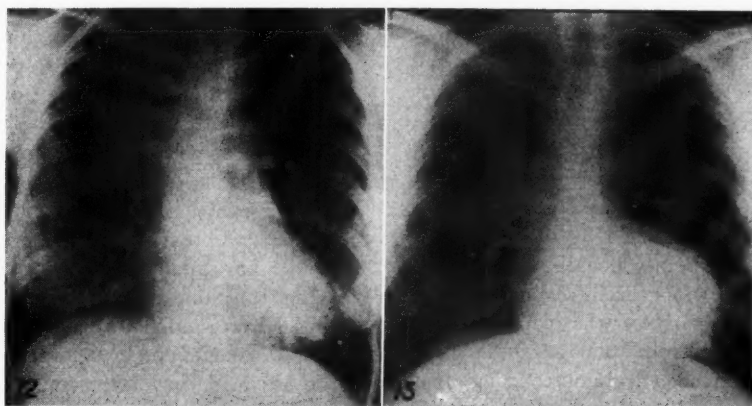


Fig. 12. Total anomalous venous connection with drainage of all pulmonary veins into a persistent left superior vena cava. The enlarged left and right superior vena cava superiorly and the heart inferiorly produce the characteristic figure-of-eight conformation.

Fig. 13. Coarctation of the aorta. The inferior borders of nearly all the ribs are notched. The characteristic notch at the site of the coarcted segment is seen in the descending limb of the arch of the aorta.

percentage it may be increased. In the latter group are those patients with so-called pink tetralogy who have only a mild pulmonary stenosis and a left-to-right shunt. Increased vascularity may also occur in the presence of a large collateral flow through the bronchial arteries or when

vascular structures are arranged in a random, disorderly fashion.

The coeur-en-sabot configuration is usually described as being characteristic of tetralogy of Fallot. This configuration has been noted, however, in only about 20 per cent of patients with

tetralogy, and its absence does not by any means preclude the diagnosis. A right-sided aortic arch is more commonly associated with tetralogy than with other cardiac anomalies, being present in about 25 per cent of patients with tetralogy (Fig. 9).

The most suggestive roentgen sign of isolated pulmonary stenosis is poststenotic dilatation of the pulmonary artery. In many cases this may be the only roentgen indication of abnormality. Not infrequently the left pulmonary artery also may be enlarged and found to pulsate vigorously, while the right pulmonary artery is normal (Fig. 10).

Anomalous Pulmonary Venous Connection

The pulmonary vascular changes in anomalous pulmonary venous connection vary greatly, depending upon the number of pulmonary segments involved. This anomaly may be present without there being any evidence of the anomalous vein or veins in the roentgenogram. The pulmonary arteries may be prominent because of the left-to-right shunt that is present, and differentiation between this condition and the other conditions in which there is left-to-right shunt is usually not possible. This condition could be discussed, as a matter of fact, along with the other anomalies characterized by left-to-right shunt, but we have chosen to discuss it under a separate heading in that there are two uncommon types of anomalous pulmonary venous connection which produce rather unusual roentgenologic signs and which may be specifically diagnosed by the roentgenologist. The first is one in which all or part of the veins from the right lung drain anomalously into the inferior vena cava below the diaphragm. In these cases the anomalous vein may be seen, on the conventional roentgenogram, coursing along the right cardiac border. When this anomaly is suspected, tomographic examination of the region readily demonstrates the vein (Fig. 11). The other type is one in which there is total anomalous pulmonary venous connection and the veins from both lungs drain into a persistent left superior vena cava or "vertical vein." The striking feature of this anomaly is the figure-of-eight conformation, with the main body of the heart forming the lower half of the "eight" and the upper half being formed by the large "vertical vein" on the left and by the enlarged superior vena cava on the right (Fig. 12).

Coarctation of Aorta

The roentgenologic diagnosis of coarctation of the aorta may be made from the conventional roentgenogram of the thorax in about 85 per cent of patients with this condition. Notching of the inferior borders of the ribs was noted in 80 per cent of 105 surgically treated patients with coarctation. The site of the coarcted segment was visualized in 26 per cent. In five cases in which there was no roentgenologic evidence of notching of the ribs, the diagnosis was established by visualization of the site of the coarctation (Fig. 13).

Summary and Conclusions

The successful surgical treatment of cardiovascular anomalies is dependent upon increasing familiarity with and more exact recognition of operable lesions of the heart and great vessels. The contributions of the radiologist in the diagnosis of these anomalies and in the selection of patients for surgical treatment are of variable but definite importance. In most instances the roentgenologic findings alone will not be unequivocally diagnostic of a specific cardiac anomaly. In many instances, however, the proper diagnosis can be suggested with considerable accuracy, or the differential diagnostic possibilities perhaps narrowed to a certain group of defects, for instance, those in which there is a left-to-right shunt. Occasionally the roentgenologic findings may be specific for a particular anomaly, as in pulmonic stenosis, coarctation of the aorta, or anomalous pulmonary venous connection.

Bing¹ has stated that "roentgenographic examination constitutes the most important part of the clinical examination in congenital heart disease." This statement, not by a radiologist but by one who has made important contributions to knowledge of cardiac physiology, constitutes an unbiased opinion of the potential importance of the radiologic examination. The extent to which this potential is realized is dependent on the radiologist's knowledge of the basic pathologic, clinical and physiologic aspects of cardiac disease and his ability to integrate this knowledge with the roentgenologic findings in a given case.

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Protrusion of Lumbar Disks Causing Marked Bilateral Weakness of the Legs

• Severe weakness of the lower extremities was present in less than 0.5 per cent of more than 4,000 patients operated on for protruded lumbar intervertebral disks. Pain was prominent early in most of these patients but, as the weakness became worse, the pain decreased or even disappeared. Severe weakness can develop within several hours in such cases, many of which are surgical emergencies. Follow-up studies available on fifteen such patients showed excellent results in five and good to fair in seven; the remaining three patients had no return of function.

HENRY E. STORINO, M.D.
ROBERT G. SIEKERT, M.D.
COLLIN S. MacCARTY, M.D.

Rochester, Minnesota

PROTRUDED or extruded lumbar intervertebral disks may so compress the cauda equina that the patient is rendered paraplegic with sphincteric disturbances, and saddle anesthesia.

Material and Methods

The records of 4330 patients who had undergone laminectomy at the Mayo Clinic for protrusion of a lumbar disk in the last five years were reviewed. Among these were the records of twenty-one patients who had reduction in motor power in their lower extremities of 50 per cent or more. These form the basis of our report. Less than 0.5 per cent of patients operated on for protruded lumbar disks in the period under consideration fell into this category of marked weakness of the lower limbs. Patients with minimal weakness in one or both lower limbs were frequently encountered but were not included in the study.

There were fourteen men and seven women in the group. The ages ranged from thirty-two to seventy-five years, fifteen being less than fifty years old. All the protruded disks were lumbar disks: the second lumbar disk was protruded in three cases, the third in three, the fourth in nine, the

fifth in one, the fourth and fifth in three, the third and fourth in one, and the third and fifth in one.

The Study

Twenty of the twenty-one patients gave a history of previous attacks of pain in the back or in the distribution of the sciatic nerve. The majority had had many recurrent bouts of such pain over a long time, ranging up to thirty years. Three patients had had only one previous attack.

In so far as could be determined, the patients apparently recovered completely from these former episodes, and the marked muscular weakness occurred during the illness which led to laminectomy.

Onset of Episode Leading to Operation.—In the majority (nineteen patients) the onset of the episode which led to operation at the Mayo Clinic was well delineated, with the first symptom in all being sudden pain in the lower part of the back with or without concomitant pain in the lower limbs. The pain varied from mild to severe. After several days or a few weeks almost all of these patients had unilateral or bilateral sciatica. Although in a few patients the weakness developed within hours, in most the onset of muscular weakness was gradual over a period of one or two weeks. Furthermore, something usually seemed to precipitate or aggravate the weakness. Such

Dr. Storino is Fellow in Neurosurgery, Mayo Foundation; Dr. Siekert is from the Section of Neurology and Dr. MacCarty is from the Section of Neurologic Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

trivial or innocuous acts as expelling an enema, sneezing in the bent-over position, gagging while brushing the teeth, or trauma in the form of strenuous muscular effort such as lifting a heavy object, manipulative therapy and leg traction initiated the attack or converted a relatively mild one into one with marked muscular weakness.

Case Reports

Two cases are reported in some detail as examples of the onset of symptoms.

Case 1.—The patient was a farmer, aged forty, who gave a history of having had sciatica on the left side for one week, six years before admission to the clinic. Two weeks prior to admission as he was putting an 80-pound welder into the trunk of his car, he had a sudden, severe, stabbing pain in his back which extended into the buttocks. The pain persisted and was aggravated by coughing, sneezing and straining. The next day he noticed weakness of the right leg and numbness and paresthesia of the right foot. Four days later he was hospitalized, and leg traction was applied to the right leg. Within a few days his left leg also became weak and numb. Urinary hesitancy developed, and he was transferred to the Mayo Clinic.

Neurologic examination at the clinic revealed atrophy of the muscles below the knee on the right. Motor power was —3 to 4 in the muscles of the right leg and —3 in the muscles of the right thigh (—4 denotes complete loss of function; 0 denotes normal function). The left lower limb was involved only slightly less than the right.

Sensation in the perianal region was —2 to pinprick and light touch. Vibratory sensation was —4 at each malleolus. Position sense was —3 at the toes. Function of the Achilles reflex was graded —4 bilaterally, that of anal reflex —4, and the tone of the anal sphincter was graded —3.

Myelography using iodophenylundecylate (pantopaque) revealed a complete block to the contrast medium at the fourth lumbar interspace. The concentration of protein in the spinal fluid was 65 mg. per 100 cc. Emergency laminectomy revealed a massive extruded disk at the fourth lumbar interspace which was markedly compressing the cauda equina. The protruded disk was removed.

Neurologic examination three months later demonstrated excellent return of motor power and good sphincteric control.

Case 2.—The patient, a man, aged forty-four, gave a history of having had recurrent sciatica on the right side for four years. Two weeks prior to being seen at the clinic he had an adjustment to his back because the right sciatica had returned. Bilateral sciatica developed immediately after the adjustment, and in a few minutes numbness in each buttock occurred. Several hours later the patient noticed difficulty in walking.

The next day he was unable to walk and was unable to void.

Neurologic examination at the Mayo Clinic two weeks later revealed an almost paraplegic man with saddle anesthesia and marked disturbances of the bladder and bowel.

The concentration of protein in the spinal fluid was 200 mg. per 100 cc. Pantopaque myelography revealed a large defect at the fourth lumbar interspace. At operation a huge extruded intervertebral disk was removed transdurally.

One year later neurologic re-examination revealed only fair return of motor power and the patient still had sphincteric disturbances.

Pain.—Pain was a prominent symptom in all twenty-one cases. Early in the course of the patient's illness the pain was often severe. Late in the course it frequently would diminish or subside completely. This subsidence of pain was coincident with the appearance of weakness; that is, when severe paresis and numbness occurred, pain (back or legs) tended to diminish and in some patients was minimal when they were seen at the clinic, at which time marked weakness, numbness and sphincteric disturbance were seen. In considering these relations, we repeatedly observed that, when pain began to diminish and weakness appeared, the probability was for further progression in the weakness.

Weakness.—Since only patients were included in the study who had marked muscular weakness in the lower limbs before operation, this was the prominent feature on clinical examination. The amount of weakness varied from patient to patient and invariably was more severe below than above the knee. This would be in keeping with the fact that the majority of patients had protrusions of the lower lumbar disks which compressed the lower lumbar and sacral roots. In six cases the weakness was asymmetrical, in the others symmetrical or nearly so. In no case in this series were the lower limbs completely paralyzed from the hips down, although in many paralysis below the knees was observed, and a few had marked weakness of the thigh and hip muscles. Much spotty weakness was observed; that is, adjacent muscles or groups of muscles were involved to different degrees. We could not correlate the level of the protruded disk with the distribution of muscle weakness. One patient had marked fasciculations in the legs.

Reflexes.—In the three patients with protrusion of a second lumbar disk, both the knee and the ankle reflexes were absent bilaterally. In sixteen of the remaining eighteen the ankle reflexes were absent bilaterally. The two remaining patients had a protrusion at the fourth lumbar interspace: one had no abnormality of the reflexes and the other had one normal ankle reflex. Anal reflexes were absent in ten patients. The reflexes, however, did not provide a reliable index as to the level of the protruded disk.

Sensory Disturbances.—Eighteen of the twenty-one patients had some sensory disturbance before operation. The other three had normal sensation despite marked muscular weakness. These three patients also had normal functioning sphincters.

Sensibility to pain and to light touch was most frequently impaired. The perianal area, the posterior aspect of the thigh, posterior and lateral aspects of the leg, and both surfaces of the feet were the regions usually involved; that is, the lower lumbar and sacral dermatomes. In only one case, a case of protrusion of the second lumbar disk, were the anterior aspects of the thighs involved. The degree of involvement varied greatly from minimal loss to absolute anesthesia in some areas. It was surprising to note in some instances that only minimal sensory loss was associated with marked weakness.

Diminution in position and vibratory sensation was noted in nine patients, and superficial sensory loss was seen without joint and vibratory loss in nine.

Sphincteric Difficulties.—Eleven patients presented difficulties with the function of the urinary bladder of varying degree, ranging from hesitancy or incomplete emptying to atonicity of the bladder with lack of sensation of a full bladder.

Ten patients, all of whom also had difficulty with the urinary bladder, had difficulty with the anal sphincter manifested by fecal incontinence or a lax anal sphincter on examination.

Roentgenographic Findings.—Plain roentgenograms of the lumbar vertebrae were normal or showed minimal hypertrophic arthritis or minimal narrowing of the intervertebral disk spaces.

A complete block to the flow of the contrast medium was seen in nine cases.

Spinal Fluid Studies.—Studies were carried out on the spinal fluid of twenty patients. The concentration of protein was 100 mg. per 100 cc. or more in twelve patients, in five of whom it was from 200 to 400 mg. In the remaining eight patients the spinal fluid contained from 20 to 100 mg. of protein per 100 cc.

Return of Function.—Follow-up data were available for fifteen patients more than a year after operation. Five showed excellent return of function with essentially normal motor power, normal sphincteric control and normal sensation, and were free of pain. Prior to operation four had paraparesis, and one was almost paraplegic. The duration of the weakness was from four days to three weeks prior to operation. Seven patients had good to fair return of function. All were free of pain. Three patients in this group of seven were almost paraplegic before operation. The duration of the disability had varied from one to three and one-half weeks prior to operation. In three patients the return of function was nil. Two of these patients had their weakness for two months before operation.

Comment

Several authors previously have presented cases of paraplegia from protrusion of an intervertebral disk (then called "ecchondroma"), and one of these, Goldthwaite,¹ in 1911, astutely reasoned that protrusion of a disk could be the cause of "lumbago" and "sciatica."

After Mixter and Barr's² work, the modern era of "the disk syndrome" began, and attention was directed to what became the more common varieties.

In the past twenty years reports have appeared in the literature describing cases of paraparesis or paraplegia caused by protrusion of intervertebral lumbar disk. Hawk,³ French and Payne,⁴ and Kennedy, Hyde and Kaufman⁵ reported series of cases. Kaplan and Umansky⁶ discussed in detail ten cases of protruded intervertebral lumbar disks with block on myelography. Graf and Hamby⁷ in 1953 found nine cases of paraplegia in a review of 840 cases in which operation was performed for protrusion of a lumbar disk. Fairburn and Stewart⁸ stressed the importance of treating such patients as surgical emergencies. Since protruded lumbar disks are common, the syndrome of paraplegia from compression of the

cauda equina, despite its relative rarity, becomes of practical importance.

In reviewing the cases in our series, we were struck by the frequency of previous symptoms so typical of the disk syndrome, frequent association of trauma, even seemingly trivial trauma, and the often minimal sensory loss in the presence of rather severe motor loss.

A long intermittent history of low back and leg pain may be seen with intraspinal tumors, and thus in some cases the differential diagnosis cannot be made easily. Bloom, Ellis and Jennett⁹ reporting on thirty-six cases of intraspinal tumors noted that an incorrect diagnosis of protruded disk was made at some time during the course of the illness in a third of the cases. These authors expressed the view that temporary remissions of pain may occur in patients with intraspinal tumors. Love,¹⁰ writing on the differential diagnosis of intraspinal tumors and protruded intervertebral disks, noted that of fifteen patients with intraspinal neoplasms, eight (53 per cent) presented symptoms of the disk syndrome, and of twenty-six with intraspinal tumors that masqueraded as protruded lumbar disk, twenty-two (84 per cent) gave a history of intermittent symptoms. Thus it seems that a history of intermittent pain in the back or of sciatica may be elicited from patients with an intraspinal tumor as well as from patients with a protruded lumbar intervertebral disk and may aid little in the differential diagnosis.

Other diseases that may have to be considered in the differential diagnosis include occlusion of the anterior spinal artery, hematomyelia, spinal extradural hematoma, extradural abscess, vascular malformations (angiomas), and metastatic tumors to the spinal column or intraspinal space. In some of these differentiation may be difficult.

Treatment

The treatment of choice seems to be early surgical management. Indeed many of these cases can be considered surgical emergencies. Although the data are suggestive only, there seems to be a relationship between the length of the preoperative weakness, the degree and the rapidity of onset in those with severe weakness and the outcome of surgical decompression.

Summary

The records of twenty-one patients with pro-

truded lumbar disks and general weakness of the legs operated on at the Mayo Clinic in the last five years were reviewed. In a few patients the muscular weakness developed within several hours, but in the majority of patients the disability occurred over a period of several weeks. No correlation was found between the level of the disk involved and the distribution of pain. The pain, however, tended to decrease as the weakness appeared and increased. Sensory disturbances were noted in eighteen patients and difficulty with the urinary bladder in eleven; ten of these eleven also had difficulty with the anal sphincter. Return of function after operation was excellent in five patients and good to fair in seven of the fifteen for whom adequate follow-up was available. In three patients no return of function occurred. Early diagnosis and operation are important in obtaining a successful result.

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Symptomatic Management of the "Nervous" Patient

• The "nervous" patient who presents bizarre symptoms of nonorganic origin often regards the physician as an expert "tester" or "repairman" on whom he can thrust his troubles and thus avoid any responsibility for solving the personal and environmental problems that are causing the symptoms. The physician may contribute to the dilemma by unwittingly accepting the patient's desire to have something "done" to him, either medically or surgically. The patient must be shown that he is the only one who can change his pattern of living, which is the cause of the symptoms.

ROBERT L. FAUCETT, M.D.
Rochester, Minnesota

MANY PATIENTS come to physicians with complaints of pains, peculiar sensations, sensory distortions, dizziness, weakness and fatigue singly and in combinations. These symptoms do not lend themselves to logical understanding; the history is unclear and fluctuating, and nothing is found on careful physical examination to explain the symptoms. Laboratory tests show nothing abnormal or, at the most, only minor deviations from normality that by no stretch of imagination could possibly explain the symptom, its persistence or its strange ability to produce such incapacity, or the demands that the patient makes on the physician. Such patients submit to, or even demand, time-consuming and expensive laboratory tests, uncomfortable examinations, long-continued use of medicaments that are expensive and often potent, and even surgical intervention. Physicians frequently allow themselves to be coerced into collaboration with the patient's wishes and demands even when their judgment tells them of the futility involved and when they have only what they know to be vain and magical

hopes that the patient somehow will improve or go away.

Origin of the Problem

How does such an irrational process develop and repeat itself over and over? Why do people communicate their difficulties in living, past and present, in such disguised and apparently meaningless terms to physicians? And why does the physician so frequently find himself treating them in such an irrational fashion, finding more and more demands made on his time and concern? Why does he persist in this contest long after he knows he is defeated? Is there any escape from or, better, any prevention for this dilemma? Perhaps a brief delineation of the roles played by both physician and patient in these situations will help discover more rational alternatives.

Many reasons exist why patients experience somatic expressions of their difficulties in living, why they fail to recognize these expressions for what they are, and why they come to physicians and then apparently endeavor to mislead them.

First, we must recognize the fact that many symptoms in this category have symbolic meanings. The commonest of this can be illustrated readily by the number of statements about interpersonal relationships that are expressed in the

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Dr. Faucett is from the Section of Psychiatry, Mayo Clinic and Mayo Foundation, Rochester, Minnesota. The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

language of organs, such as, "She gives me a pain in the neck," "What a headache this job is," "I have no taste for that," "This gripes me," "My heart isn't in the work," "This turns my stomach," and many others expressed in four-letter words and describing more elemental physiologic as well as psychologic functions.

Secondly, we must try to understand the "advantages" of the role of the physically ill person in our modern Western civilization. He is excused from much responsibility, blame and failure. He can expect to be treated, at least for a time, with sympathy and kindness. It is much more acceptable to express feelings in the language of organs than it is to admit to having feelings of dependency and regressive longing. It is much safer to say that one has a headache than to express directly the rage felt toward an unreasonable boss. It saves self-esteem to believe that one has a glandular disorder rather than a deep-seated sense of sexual inadequacy.

Thirdly, by describing his difficulties in terms of the physicochemical machine, the patient throws all the responsibility on the expert "tester" or "repairman" we call the physician or surgeon and evades responsibility for his own health. If the difficulty is physical or structural, the patient has only to lie still while the surgeon cuts, or to pay for the pills the internist prescribes. On the other hand, if he admits that the difficulty exists in the interpersonal field, this obviously means that he himself must participate in and be responsible for his recovery. This is only another way of describing unrealistic dependency needs that the patient attempts to extract from the physician.

Fourthly, our culture and child-rearing customs make it difficult for all of us to talk with another human being, even in the most permissive setting, about intimate personal relationships and even more difficult to talk about the feelings associated with these relationships, especially if such feelings are thought to be culturally unacceptable. A corollary to this is the fact that patients assume that the repairman wants to hear language descriptive of the breakdown of the machine and, unless he is encouraged to do otherwise, he will translate what he knows to be interpersonal difficulty into "organ" or "machine" language. The traditional methods of taking medical histories tend to encourage this type of communication. Thus, the patient talks about what

he assumes he is supposed to talk about.

Fifthly, there is a phenomenon that psychiatrists refer to as "transference." Man is a remembering, symbolizing animal who, for purposes of economy, has many automatic or unconscious emotional reactions. As children, all of us had to devise a set of operations that would allow us to be as comfortable as possible in our relationships with authoritarian people, meaning parents. The characteristics of this set of operations necessarily will be related to the behavior and attitudes of the parents. The child learns to react regularly once he has learned what is necessary to keep both himself and his parents comfortable. He learns to trust or distrust them, he learns the areas in which they practice duplicity, and he learns their reactions to his dependent needs, their behavior when he becomes ill, what their limits of tolerance to frustration are, the premonitory signs of approaching anger, what modes, if any, of expression of his own anger are safe, the kinds of disturbances that occur if he has questions about sexual matters, and so on. Almost all patients experience some degree of tension in dealing with physicians about the same things.

All of this becomes a part of the patient's set of operations in dealing with authority. As the child grows, these modes are extended to deal with other figures of authority, such as physicians. If he has been reared in an atmosphere of anxiety, insecurity and inconsistency, the perimeters of his awareness and judgment are narrowed, and his emotional expectations and reactions become stereotyped, rigid and fixed.

The Physician-Patient Relationship

Thus, the patient brings all of this experience to his initial contact with the physician. The physician-patient relationship contains everything to remind the patient of his childhood days. He is weak and helpless, whereas the physician is strong and all-powerful (or at least he must act as if he were). The physician is possessed of special knowledge that the patient dares not question, at least openly. So it is that the relationship of physician and patient is made in advance. It is a relationship of the patient to the physician as an authority and not to the physician as a person.

This physician-patient relationship can be a powerful helping tool or a disruptive influence.

The transference exists and exerts its force. This is the tool that psychiatrists use in psychotherapy; it is their only effective one, but it does not belong exclusively to them. This emotional relationship is not a rigid unchangeable one. Insofar as the physician does not react in a manner similar to that of the patient's parents and insofar as he is able to talk directly with the patient about his masked and hidden feelings and make him aware of their inappropriateness to the present situation, he will diminish the patient's anxiety and give him an opportunity to become more nearly adult. This must be done with the attitude of a good parent, one who is kind, firm, benevolent and self-respecting. Anxiety or anger in the physician will interfere greatly with such an attitude.

How the Physician May Compound the Problem

The physician may contribute to the dilemma in a number of ways. First, most physicians have been trained to view the patient as a physicochemical machine. The language of medicine, the idiom in which they feel most competent and at ease, is that of the breakdown of organs. Their tools and techniques are devised to repair breakdowns or remove diseased parts. If the physician is to maintain his position as an expert, a position on which his self-esteem depends, he must stay in that area of operation in which his knowledge and experience are secure.

Secondly, the physician, from experience, recognizes the gain that the patient gets from conceiving of himself as being physically ill. He knows the adverse reaction of the patient if he does not offer confirmation of this hope or some alternative.

Thirdly, we physicians must consider that, to some extent, we all enjoy the magical powers with which some patients endow us. We may derive some gratification out of the sense of power thus gained and thus may hesitate to expose ourselves as inadequate to solve the patient's problems. Therefore, frequently unwittingly, we accept the patient's desire that we do something to him without his participation or acceptance of responsibility and start down the primrose path of practicing magic in the form of "harmless medication" or "reassuring surgery." We have been well taught that the physician must do "something," even if it means assuming unrealistic responsibility. Once such action is begun,

it is well-nigh impossible to stop and still save face or the patient's trust; thus, one bit of magic leads to another.

Fourthly, physicians are products of the same culture that produces the patients and thus are also faced with hesitancy at listening to a patient's recital of intimate personal events and feelings, especially if the physician feels he must do something instead of giving the patient responsibility for change. Advice is usually worse than useless. This is made more so by the fact that in giving such advice the physician ordinarily abandons his role as an "expert," since now he must take leave of the sense of security he has in his knowledge of the person as a physicochemical machine and see him as a psychosocial being with unconscious motivation that has roots in the dim, unremembered past.

Fifthly, we frequently forget transference and tend to take our relationship with patients at face value. We expect them to relate to us as people who are trustworthy and honest. If all patients felt this way, life would be simple. However, some lie and cheat and do not follow advice and are, in fact engaged in a battle to frustrate and deceive and eventually defeat us, as they have longed to defeat their parents. To keep life as simple as possible, we ignore transference but later are angered and frustrated.

Lastly, the power of suggestion is highly overrated. If patients with emotional problems could be cured of their difficulties by suggestion, there would not be so many continuing to inhabit physicians' offices and demanding new brands of incantation.

Consequences of Avoiding the Problem

What are the untoward consequences of following such an irrational path of least resistance?

The application of knowledge derived from study of the person as a physicochemical machine is not successful in solving problems of interpersonal relationships.

The expectation of "magical" solutions is increased and perpetuated in the patient population. I suspect that this process accounts to a large degree for the increasing derogation and dissatisfaction with the medical profession as a whole in the face of marvelous advances in technical knowledge and skill in relieving physicochemical breakdowns.

The acceptance of the total responsibility to "make the patient well" by suggestion, surgery or sleeping pills does not educate him or point out to him the source of his difficulties. Consequently, it prevents him from accepting some responsibility for his distress and its relief. As long as his attention is focused on his organ system as the seat of the difficulty, there is nothing he can do to help himself.

He may suffer from secondary complications of the attempt to cure him by repair of the machine or by giving medicaments.

His confidence in, and reputation with, physicians may suffer so that when a structural illness supervenes he is denied the benefits of modern medical skill by unwillingness to see a physician or by preconceived notions of the nature of his trouble by his physician.

The complication of financial stress may increase his troubles.

How to Alleviate the Problem

What can be done to escape from and diminish the dilemma?

When reasonable skill and judgment and diagnostic acumen have been applied by history, physical examination and laboratory tests, the physician must stop the search for physicochemical causes and remedies. He must abandon his belief in magic.

The patient should be informed of the lack of findings to explain his symptoms, that there is no need to search further, and of the opinion of the physician that feelings or problems in living are the basis of the problem. Euphemisms, such as, "It's your nerves," or "nervous exhaustion," cannot be used, since such phrases encourage the patient to continue to focus on the physicochemical machine and not on environmental events. It must be made explicit that the complaints represent expressions of interpersonal conflict and emotional stress.

It will help if the physician explains that the alleviation of the problem requires effort and acceptance of responsibility on the part of the patient. The patient's objections should be anticipated by alluding to the fact that the physician or anyone else cannot solve problems by doing

something to him as he had wished. The dependency aspects of the situation can thus be made clear.

Some patients can readily translate their troubles from the language of organs into psychological language if they are given the opportunity and if they are told of the nature of their trouble. They can be encouraged to talk about their problems to a spouse, a friend, a minister or the physician, if he is so inclined, or it can be indicated that a psychiatrist might be of help. The patient's response to this invitation or suggestion is the best indication as to the likelihood of his being able to make the translation and perhaps do something about it. He should not be sent to a psychiatrist unless he requests it, since in all likelihood a forced or cajoled referral will only waste his time and that of the psychiatrist.

Many patients obviously will not respond constructively to such suggestions (and they should always be suggestions and not dictums). Three alternatives are then open to the physician and patient.

1. The patient always should know that he is free to get another opinion.
2. He may wait and see what develops. The physician must resist the temptation to offer placebo medication or another laboratory test at this point or he is lost.
3. In some patients in whom the onset is recent and in whom the precipitating environmental stress is obvious and temporary, resort to sedatives or tranquilizers may be elected, but the use of such agents should be prefaced by discussion of the fact that they are symptomatic and temporary expedients and that they are not curative agents nor problem solvers but are only given to help the patient mobilize his resources to face his problems in living.

A Final Word

All of the foregoing simply represents an attempt to eliminate or diminish irrationality, magical omnipotence and suggestion as implements in the physician's armamentarium, and to point the way toward returning the responsibility for altering living patterns to the patient, who is the only one who can change them.

Varicella Pneumonia with Prolonged Roentgenologic Change

• It is important for the physician to be alert to pneumonia caused by the varicella virus. The use of ACTH and adrenal cortical steroids in therapy is evaluated here, with the suggestion that these drugs may prove a valuable addition to the armamentarium for this serious complication of chickenpox.

ALLEN G. BRAILEY, JR., M.D.

KJELD O. HUSEBYE, M.D.

Saint Paul, Minnesota

CHICKENPOX is usually a benign childhood disease without serious complications. Although fatal viral dissemination has occurred in the neonatal period,¹ and has been found in some cases of varicella pneumonia,²⁻⁴ the most important complication of chickenpox is pneumonia. The pneumonia was formerly considered bacterial in nature, and appeared usually after defervescence of the chickenpox. A pneumonia in adults caused by the varicella virus synchronous with dissemination of the skin lesions was first described in 1942 by Waring.⁵

The present report is based on experience with three patients having certain unusual features who were recently observed by the authors, and on a review of the literature—to make a total of sixty cases.²⁻²⁵ Forty-seven of the sixty cases were between twenty and forty years of age. The youngest was twenty-three and the oldest seventy-one years old. There were twenty-seven female

and thirty-three male patients. In thirty-five instances a history of exposure to chickenpox was obtained, frequently the contact being the patient's own children.

The typical exanthema appeared within two to three weeks after exposure. The interval between onset of rash and respiratory symptoms was known in thirty-six instances. Eleven patients experienced cough within twenty-four hours, twenty-one within two to four days and three on the fifth and sixth day. Pulmonary symptoms preceded the skin manifestations in one patient. The skin eruption was originally scanty but became widespread with the development of cough and dyspnea.

The appearance of pneumonia was almost invariably marked by high fever, striking toxicity, productive cough and dyspnea. Of fifty-four patients with detailed case reports, twenty-eight experienced hemoptysis and thirty exhibited cyanosis. Chest pain was noted in twenty-one instances. The acute phase of respiratory distress lasted from

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three to six days, and was followed by lysis of fever, diminution of cough and cessation of sputum production. This usually coincided with encrustation of the skin lesions. Nonproductive

Seven patients expired during the acute phase of pneumonia—a mortality rate of 11.6 per cent. Three died within the first twenty-four hours and four others within one week. All were young,

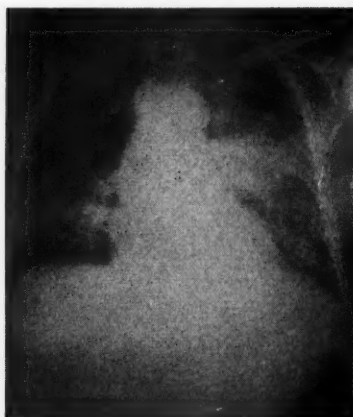


Fig. 1. Chest roentgenogram showing scattered fluffy densities and confluent perihilar infiltrate on the first day of pneumonia. (E. B., Case 1.)

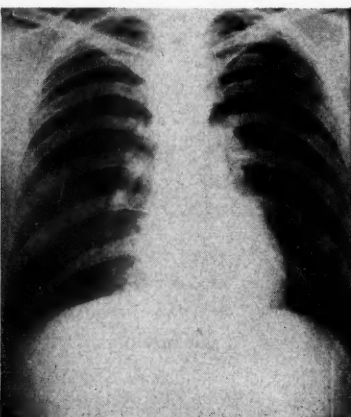


Fig. 2. Persistent military infiltration one month after the onset of pneumonia. (J. S., Case 2.)

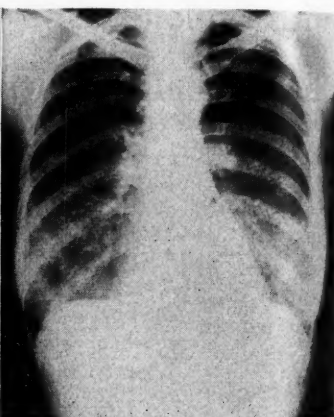


Fig. 3. Persistent military infiltration one month after the onset of pneumonia. (A. S., Case 3.)

cough and easy fatigability often continued for several weeks. Of forty-nine patients with stated morbidity, thirty-three were well or discharged by the fourteenth day. Antibiotics did not influence the course of the uncomplicated case.

The rapid development deserves emphasis. One patient complained of cough and heavy breathing after getting to bed. He sat up in a chair to seek relief and was found dead two hours later.⁵

Roentgenologic examination revealed diffuse, military infiltration with coalescent areas spreading from the hilar regions into the lower lung fields. The pulmonary infiltration was followed in nineteen patients to complete resolution: three cleared within two weeks, nine in two to four weeks, four between one and three months and three before six months after the onset of varicella. The remainder were either not reported on (nineteen cases), lost to follow-up (twelve cases) or dead (seven cases). One patient received cortisone during the height of the pneumonia, and the lesions remained unresolved at six months. Two patients reported herein in detail exhibited persistent pulmonary infiltration after fifteen months.

White blood counts were usually below 10,000 per cubic millimeter, and differential counts were within normal limits. Blood and sputum cultures revealed no pathogens.

previously healthy adults, with the exception of one woman with pulmonary sarcoidosis who was seventy-one years of age.

At necropsy, small and large nodules were found widespread in the pulmonary parenchyma, and small vesicles were spread over the pleural, esophageal and tracheobronchial surfaces. Focal necrosis and proliferation of alveolar septal cells with intranuclear inclusion bodies, mononuclear cells, fibrinous exudate and necrosis of arteriolar walls were noted on microscopic examination.

Case Reports

Case 1.—(UMH 915360). B. E., man, aged sixty-seven, with a pruritic skin rash of five days' duration entered the University of Minnesota Hospital on July 21, 1957. A diagnosis of chronic lymphatic leukemia had been made ten months previously and remission achieved with large doses of cortisone. A maintenance dose of 15 mg. of prednisone was given daily before admission. The patient gave a history of chickenpox in childhood.

The temperature was 104 degrees orally; blood pressure, 150/80; pulse rate, 120. Maculopapules and vesicles were scattered over the trunk, arms and thighs. Shotty cervical lymphadenopathy was present. He had a hacking, nonproductive cough, but the lungs were clear to auscultation. The hemoglobin was 12.2 gm.; white blood count, 5,700 per cubic millimeter with a normal differential count. The next day he became cyanotic with rapid respirations and he appeared markedly toxic. The cough became worse, and numerous wet rales were

heard over both lungs. A roentgenogram of the chest revealed patchy densities scattered diffusely throughout both lung fields with confluent infiltrates radiating from both hilar areas (Fig. 1). Cultures of expectorate, blood and vesicle fluid yielded no bacterial pathogens. Attempts at virus isolation from vesicle fluid and serum by tissue culture technique were unsuccessful. The administration of 15 mg. of prednisone daily was continued, and chloramphenicol, 500 mg. every six hours, was given for six doses and then discontinued when negative bacterial cultures confirmed the impression of viral etiology. Dr. Francis W. Lynch, dermatologist, believed that morphologically the rash was more characteristic of herpes zoster than of varicella.

The temperature fell to normal by lysis four days after onset, and the patient improved rapidly. Twelve days after onset of respiratory symptoms the lungs were clear to auscultation. A roentgenogram of the chest on August 30, 1957, showed clearing of the miliary lesions, although the perihilar confluent infiltrate had not yet disappeared.

Case 2.—J. S., a man, aged thirty-seven, who had received 100 mg. of cortisone daily for one month, three years previously, developed chills, high fever and a rash typical of chickenpox on February 4, 1957. One son had chickenpox two weeks before, and two other children came down with the disease simultaneously with their father. The disease ran a benign course in the children.

Within two days the rash was followed by dysphagia, and, within four days, by cough productive of blood-streaked expectorate. Examination revealed a critically ill patient with high fever, confusion, dyspnea, rales throughout both lung fields and vesicles in the mouth, hypopharynx and larynx. The patient was treated at home with daily injections of ACTH and broad spectrum antibiotics with an immediate remarkable improvement. A roentgenogram of the chest one month after onset showed miliary infiltration (Fig. 2), and prednisolone (40 mg. daily) was given and continued in decreasing dosage for four weeks. One of us (Dr. Husebye) saw the patient at this time and found the lungs to be normal to auscultation. Subsequent roentgenograms of the chest (the latest taken fifteen months after the acute disease) show persistent diffuse pulmonary infiltration. The patient remains well.

Case 3.—A. S., a woman (aged fifty-five, and the mother of J. S., above) had received a prolonged course of steroid medication up to three months before onset of a similar disease picture, starting simultaneously with J. S., and following a similar pattern. The patient was treated in the same manner with ACTH and broad spectrum antibiotics. A roentgenogram of the chest one month after onset showed miliary infiltration (Fig. 3), and prednisolone was given for four weeks. At the end of this course of therapy the patient was seen by one of us (Dr. Husebye) and the lungs found to be essentially negative to auscultation. Subsequent roentgenograms of the chest (the latest taken fifteen months after the acute disease) show persistent miliary pulmonary infiltration, more marked than in J. S. The patient

remains well, but with some shortness of breath on exertion.

Discussion

Varicella and herpes zoster are thought to be different manifestations of infection with the same virus.²⁶ Netter has demonstrated antibodies in varicella convalescent serum using zoster vesicle material as antigen and has demonstrated cross immunity in the reverse situation.²⁷ The occurrence of varicella pneumonia has been described in a patient exposed to herpes zoster.⁷ It has been suggested that varicella virus remains dormant in the skin, suppressed by partial immunity, following clinical chickenpox, and later produces zoster in response to a variety of stimuli.²⁶ Case 1 would appear to represent zoster-varicella virus pneumonia as a complication of the frequent association of generalized herpes zoster and chronic lymphatic leukemia.

ACTH and adrenal cortical steroids are valuable adjuncts in the management of patients with severe toxicity due to certain bacterial infections when they are given for brief periods of time and in conjunction with effective antibiotic therapy.²⁸ In viral infections, which in general are not susceptible to specific antibiotic or chemotherapeutic agents, the administration of these hormones may be followed by a spread of the infection, even though the immediate subjective result seems encouraging. Thus fatal varicella was observed in two children receiving steroid medication,²⁹ and reactivation of cutaneous varicella by cortisone ingestion has been reported.³⁰ An inquiry to sixty-five physicians in this respect yielded ten additional fatal cases of chickenpox in children receiving cortisone.³¹

The persistence of the roentgenologic changes in Cases 2 and 3 fifteen months after varicella pneumonia suggests the possibility of a relationship to the use of ACTH during the acute illness, or to the previously administered adrenocortical hormones. If this were the case, then increased invasiveness or persistence of virus in the tissues during steroid medication, as have been observed in certain experimental bacterial infections,³² are possible mechanisms by which the steroids could have enhanced development of more severe infiltration. More likely the administration of ACTH in Cases 2 and 3 reversed the toxic picture in patients who otherwise would have succumbed to their disease, and the present roent-

genologic picture reflects the seriousness of the acute phase.

The administration of prednisolone after the defervescence of the acute symptoms did not appreciably affect the resolution of the diffuse pulmonary infiltration.

Summary

The clinical features of fifty-seven cases of varicella pneumonia (reported since 1942) and three additional cases observed by the authors have been reviewed.

The first of the authors' cases was an example of zoster-varicella virus pneumonia in a patient with chronic lymphatic leukemia and the cutaneous manifestations of generalized herpes zoster. The second and third cases showed persistence of miliary pulmonary infiltration on roentgenograms of the chest taken fifteen months after the acute illness.

It is important for the physician to be alert to the occurrence of pneumonia caused by varicella virus. The often deleterious effect of ACTH and adrenocortical hormones in varicella has been discussed. However, these drugs *may* prove a valuable addition to the armamentarium in a limited number of critically ill patients with chickenpox.

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Surgical Correction of Some Deformities of the Chest Wall

LYLE A. TONGEN, M.D.
Saint Paul, Minnesota

PECTUS EXCAVATUM is a funnel-shaped deformity of the anterior chest wall. It consists of a depression of the body of the sternum with the lateral walls formed by the deformed adjacent costal cartilages. It is usually noted soon after birth and tends to progress in severity. Brown¹ and Lester² believe that it is caused by a neuromuscular imbalance of the diaphragm, whereby the anterior-posterior fibers are overstimulated, causing retraction of the lower part of the sternum. Sweet³ suggested that it may be due to an overgrowth in length of the ribs and cartilages, pushing the sternum more deeply into the chest. Perhaps both are right. There is a definite hereditary tendency. Two of the patients in this series were brothers, whose father and grandfather had the same deformity.

The anterior-posterior diameter of the chest is decreased, resulting in a wide, flat chest, with the funnel deformity over the lower sternum. The heart is displaced to the left and there is a decreased ventilatory capacity.¹ The costal margins flare outward, resulting in a protuberant upper abdomen. The victim of this deformity is characteristically thin, flat-chested, round-shouldered, stooped, pot-bellied, and presents the impression of being chronically weak and debilitated. Occasionally, an exception occurs and the individual presents an otherwise normal physique.

The symptoms are physical and psychological—usually some of both. The physical aspect of the victims certainly is not one to inspire pride. They are often apathetic and poor eaters. They are ashamed of their deformity and refrain from playing and mixing with other children. They are apt to have frequent respiratory infections. As they grow older and the severity of the deformity progresses thus reducing the ventilatory capacity and causing more marked cardiac displacement, more serious pulmonary and cardiac symp-

Protrusion or depression of the anterior wall of the chest may produce psychological or physiological symptoms, or both. Surgical correction of the deformity, preferably in early childhood, allays such symptoms with only small risk.

toms may occur. None of the patients in this report presented these symptoms, but Ravitch⁴ reports a survey of such cases described in the literature.

An excellent historical survey of the surgical treatment of this deformity was made by Och-sner and DeBailey⁵ in 1939. In the same year Brown⁶ described the surgical repair in two cases, which is the basis of most present methods of repair. The method of repair used in this series consists essentially of: excision of the deformed cartilages, division of the attachment of the diaphragm to the lower sternum and xiphoid process, a wedge osteotomy of the sternum at the upper edge of the deformity, and raising and fixing the depressed part in normal position. A vertical incision is made in the midline. Skin flaps and flaps of pectoralis muscle are raised, laying bare the sternum and the costal cartilages. All deformed cartilages are removed subperichondrally, being sure to include excision of the cartilages in the wide flaring costal margins. An incision is made in the substernal ligament, and xiphoid process and lower part of the sternum are separated from the diaphragm. The anterior mediastinum is entered and the posterior aspect of the sternum separated from the mediastinal structures by blunt dissection. A wedge osteotomy is made in the sternum at the upper edge of the deformity. The depression in the sternum is corrected and the osteotomy secured by stitches in the periosteum. A large-gauge stainless steel wire is placed around the body of the sternum and

¹Presented before the Minnesota Academy of Medicine, March 12, 1958.

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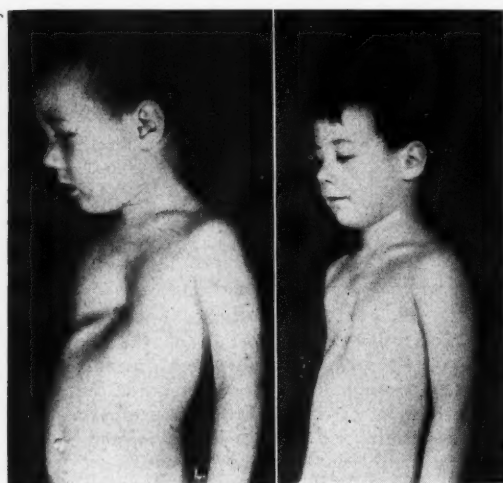


Fig. 1. Patient D. L., aged three, Pectus Excavatum. (a) Before operation. (b) Two years after operation.

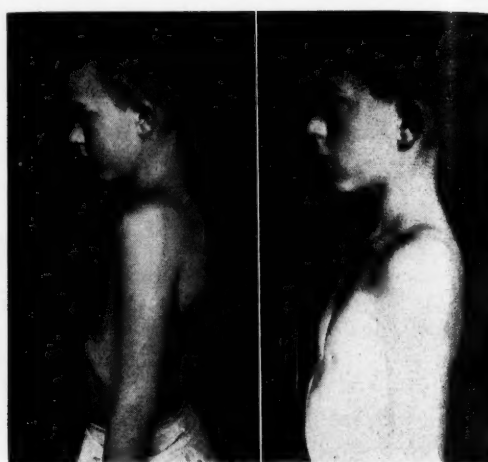


Fig. 2. Patient J. J., aged eight, Pectus Excavatum. (a) Before operation, showing the dorsal kyphosis and flaring costal margins. (b) Two and a half years after operation.

TABLE I. PATIENTS TREATED FOR PECTUS EXCAVATUM

Patient	Sex	Age	Lesion Noted at	Date of Surgery	Postoperative Course	Result
P.V.	M	20 years	Age 4-5 years	3- 4-54	Uncomplicated	Satisfactory
J.J.	M	8 years	Birth	4-14-54	Uncomplicated	Satisfactory
J.K.	M	13 years	Age 4-5 years	10-28-54	Uncomplicated	Satisfactory
J.P.	F	7 years	Age 1 year	2- 2-55	Uncomplicated	Satisfactory
W.N.	M	9 years	Birth	4- 7-55	Uncomplicated	Satisfactory
D.B.	M	4 years	Birth	4-15-55	Uncomplicated	Satisfactory
A.K.	M	5 years	Birth	9-27-55	Pneumothorax with catheter drainage	Satisfactory
D.K.	M	2 years	Birth	11- 8-55	Uncomplicated	Satisfactory
D.L.	M	3 years	Age 1½ years	12- 5-55	Pneumothorax with catheter drainage	Satisfactory
D.DeF.	M	12 years	Age 10 mo.	2-27-56	Pneumothorax with catheter drainage	Satisfactory
M.B.	F	4 years	Age 1 mo.	11- 5-56	Superficial wound infection	Satisfactory
E.R.	M	6 years	Birth	5-20-57	Uncomplicated	Satisfactory
R.Z.	M	3 years	Birth	2-14-58	Uncomplicated	Satisfactory

brought out through the muscle and skin flaps for subsequent support of the sternum. The wound is closed, approximating the flaps of pectoralis major muscle and fascia to each other and to the periosteum of the sternum. No drainage is used. After closure the wires are fixed to a ladder splint of appropriate size to hold the sternum in a stable, slightly over-corrected position.

This report is based on experience with thirteen cases of pectus excavatum. There have been no deaths. The results have been satisfactory in all. The only complication of this operation was a pneumothorax in three instances. This was dealt with by the insertion of an intercostal catheter and attachment to a gentle suction device for several hours. The patients are ambulated on the first or second postoperative day. The splint and wire are removed at the end of three weeks. Although many surgeons have abandoned the use of any external fixation, it seems to me that the

stability it lends to the sternum (in the corrected position until considerable healing occurs) is worth while. There have been no important complications related to its use.

A satisfactory correction has been possible in all cases. The parents and the patients old enough to express an opinion have been pleased. It is not unusual to have the parents volunteer the information that the patient has a better appetite, fewer colds, and is much more active and vigorous since having the operation.

Protrusion Deformities of the Anterior Chest Wall

Lester⁷ divides these deformities into two classes: those involving the midline or sternum (pectus carinatum) and those occurring laterally and involving the costochondral junctions. The midline deformity, commonly referred to as pectus carinatum or pigeon breast, consists of protrusion

DEFORMITIES OF THE CHEST—TONGEN

of the middle and lower sternum with bowing outward of the adjacent costal cartilages to form a prow-like anterior chest wall, mindful of the breast of a chicken. The lateral deformities are

wire around the sternum attached to an external ladder splint is used in the same way except that an intervening buttress of sponge rubber is fixed between the splint and the sternum, and the mo-

TABLE II.
PATIENTS TREATED FOR PROTRUSION DEFORMITIES OF ANTERIOR CHEST WALL

Patient	Sex	Age	Type of Defect	Date of Surgery	Postoperative Course	Result
G.S.	F	20 years	Unilateral—severe	4-24-56	Pneumothorax with catheter drainage	Improved
R.S.	M	16 years	Midline	6-25-56	Small pneumothorax—no treatment	Satisfactory
C.H.	F	12 years	Unilateral	10-15-56	Uncomplicated	Improved
S.N.	F	21 years	Bilateral	1-10-57	Uncomplicated	Improved
J.Z.	M	16 years	Midline	6-24-57	Uncomplicated	Satisfactory
A.S.	M	16 years	Midline	2- 7-58	Small wound slough	Satisfactory

usually unilateral and consist of a buckling outward of the costochondral junctions. They may be localized to one or two rib segments or may involve all of the rib segments and result in a large deformity with tilting of the sternum. Lester⁷ suggests that protrusion deformities result from abnormalities in the growth of the ribs. If bilateral, overgrowth of the ribs occurs and a midline protrusion of the sternum results. If there is a disproportionate growth on one side as compared to the other, buckling will occur at the costochondral junction.

Symptoms due to physiological causes are seldom definite, and none were noted in the patients in this series. Lester⁷ feels that these deformities frequently cause respiratory symptoms that are related to the prevention of free excursion of the diaphragm, thus making the cough less efficient. The cosmetic defect is apt to be even more unsightly and disturbing to the victims than that associated with pectus excavatum. Lester has established surgical correction on the principle of thoracoplasty. This principle is used in this series in the correction of lateral deformities. It yields an excellent result in small localized deformities where the remainder of the chest wall is essentially normal. In the extensive lateral deformities the general deformity of the chest wall is so great that the removal of the buckled ribs and cartilages does not restore a normal contour. In such cases, although some improvement occurs, one is apt to be disappointed in the result. I have dealt with pectus carinatum or midline deformities in exactly the same way as with pectus excavatum except that a complete transverse osteotomy is done at the upper edge of the defect instead of a wedge osteotomy. A

bilized sternum is held down in the proper position rather than held out as in the correction of pectus excavatum. Three cases have been done in this manner with good results.

Discussion

In children, the presence of a significant deformity, especially if it is progressing in severity, is sufficient indication for surgical correction. The indications are more compelling if symptoms are present. Indeed, if the deformity is progressing, one can anticipate that symptoms will occur as the child grows older and the deformity increases in severity. There is some controversy over the optimum age at which repair should be done. Surgical correction can be done safely in infants, but I see little need for such haste. I prefer to wait until the child is three or four years of age. By this time we can be sure that the deformity is progressing and that surgical correction is advisable. By doing it at this time the correction is done before starting school and therefore before the child is exposed to the traumatic experiences related to the cosmetic defect. If significant symptoms are present, surgical correction can be done at any time. In adults correction is indicated by the presence of symptoms. Occasionally patients will feel so strongly about the unsightliness of the deformity that correction is justified. However, a good cosmetic result is more difficult to obtain, and the benefits of cosmetic correction have largely been lost.

In six of the patients in this series pectus excavatum was noted at birth. In the other six patients the defect was not noted until one month to four years of age.

The details of the operative technique differ in

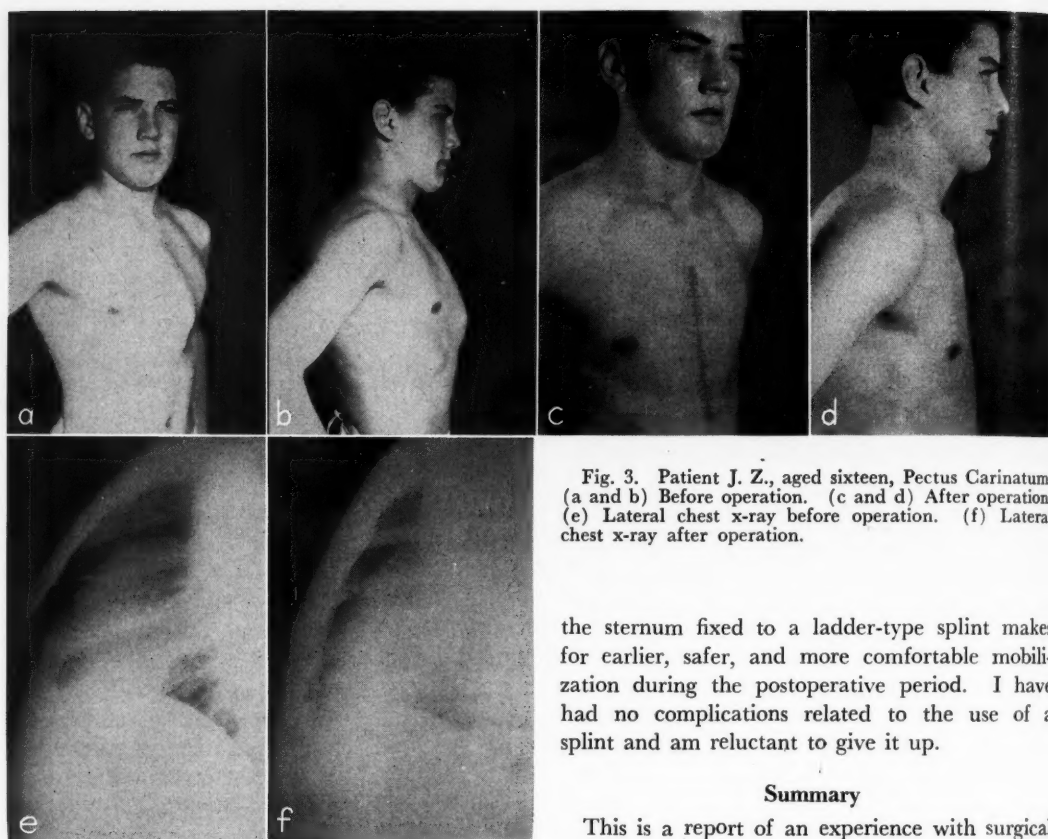


Fig. 3. Patient J. Z., aged sixteen, Pectus Carinatum. (a and b) Before operation. (c and d) After operation. (e) Lateral chest x-ray before operation. (f) Lateral chest x-ray after operation.

some slight respects to those reported by others. No stitches are placed in the bone at the site of the osteotomy. The bone in young children is very friable and will not hold a good stitch. Secure closure can be obtained by stitches in the periosteum, which is tough and strong. I have extended this technique to the closure of all types of sternotomy wounds in all ages and have found it to be quite adequate. The xiphoid process is not removed. The removal of the cartilages in the wide flaring margins is considered to be essential to a good cosmetic result. No attempt is made to shorten the intercostal bundles lateral to the mobilized sternum. Some of us still cling to the old-fashioned practice of using some type of external fixation until healing is well established. I am aware that the use of such a splint is not essential to a good result. However, the firm stability that is obtained by a wire around

the sternum fixed to a ladder-type splint makes for earlier, safer, and more comfortable mobilization during the postoperative period. I have had no complications related to the use of a splint and am reluctant to give it up.

Summary

This is a report of an experience with surgical correction of thirteen cases of pectus excavatum and six cases with protrusion deformities of the chest wall. It is possible to accomplish a satisfactory correction at very small risk. The amelioration of psychological and sometimes physiological symptoms related to these deformities appears to make this risk worth while.

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Fractures About the Knee Joint

RICHARD REILEY, M.D.
Minneapolis, Minnesota

THE KNEE joint is the largest weight-bearing joint in the body, having the characteristics of both a "hinge" and a pivot joint. Fractures involving it usually follow accidents of more or less violence, thus seriously disabling the joint and the patient, and involving a long period of rehabilitation. The often asked question, "Will my knee be stiff, Doctor?" is not entirely without foundation, since either flexion or extension contractures are highly disabling as are persistent atrophy, joint derangements, instability, traumatic arthritis, and post-traumatic synovitis with effusion.

Treatment of this group of fractures therefore involves recognition of the type of fracture involved, appropriate prompt treatment and immobilization, and adequate rehabilitation which must be started with reduction of the fracture and

Treatment of fractures of the knee joint requires thorough familiarity with the mechanics of this very important weight-bearing joint. Dr. Reiley reviews some of the commonly encountered types of knee fractures and the problems involved in treatment and rehabilitation.

continued religiously until the desired result is obtained. This consists of quadriceps "setting" exercises during immobilization and whirlpool baths, massage, active and assisted active exercise following immobilization. Resistance exercises are started as soon as fracture healing has progressed to the point where it will allow them.

Immobilization may consist of a single hip spica for supracondylar, intercondylar or condylar fractures; cylinder cast for fractures of the patella; or a long leg cast for fractures of the proximal tibia—either "Y" or plateau fractures.

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Dr. Reiley is Clinical Assistant Professor of Surgery, Department of Orthopedics, University of Minnesota Medical School.

OCTOBER, 1958

FRACTURES ABOUT THE KNEE JOINT—REILEY

A long leg cast—with the knee flexed—is sufficient for separations of the lower femoral epiphysis after closed reduction.

If traction is used, skeletal traction is preferred and pins may be incorporated in the cast to maintain reduction, but care must be exercised to prevent motion of the pins and development of a "claw foot" if a pin through the os calcis is used. It is our policy to remove pins after the plaster has been applied in order to avoid pin-track infections and foot deformities.

Since the patella is a sesamoid, it is simply a condensation of the quadriceps and patellar tendons, and a fracture of the patella with separation means a rupture of the extensor apparatus of the knee. Undisplaced fractures require only immobilization in a cylinder cast for a period of six weeks to allow healing of the tendinous structure so that active exercise may be started. Displaced fractures require open fixation, excision of part, or the entire patella. Since the patella serves to lift the extensor mechanism away from the femoral groove to improve its leverage, it must be shortened if the entire patella is removed, otherwise some loss of sustained effort in extension may occur.

Partial excision of the patella is very successful, provided the remaining portion is smooth and not involved by chondromalacia or degenerative changes. Bipartite patella is often mistaken for a fracture and if there is a question of this the opposite knee should be x-rayed.

An example of comminuted fracture of the lower pole of the patella which was excised is shown. Cylinder cast was applied for six weeks and the patient now has, to all intents and purposes, a normal knee (nine months).

Plateau fractures of the tibia may involve one or both plateaus with an inverted "Y" fracture of the proximal tibia. Those are usually produced by direct violence and result in downward and forward displacement and/or central depression of a portion of the articular surface. The medial or lateral meniscus is frequently involved and excision becomes necessary. Accurate reposition of these fractures is imperative, tears of the collateral ligaments must be recognized and repaired. They are frequently "jig-saw puzzles" to be replaced. Central depressions must be elevated and held up if necessary by a bone-graft peg or strut.

Single or double plateau fractures without central depression and with large fragments involved can often be reduced by closed methods and held. Comminuted fractures with or without central depression usually require open fixation of some type. Fixative materials include screws, transfixion bolts, or wires. Occasionally a severely comminuted fracture will require arthrodesis of the knee to secure a painless, stable knee.

Similarly fractures of the femoral condyles often require open fixation to maintain position. Again transfixion bolts, screws, femoral blade plates, screw plates, or Rush pins may be used. Both supracondylar and intercondylar fractures are notorious for length of healing time and subsequent disability of the knee joints. Open operations and fixations seem to reduce this somewhat but not as much as we would desire.

Skeletal traction with the knee flexed is often effective but involves a long period of hospitalization and constant attention. Closed reductions should usually be tried under controlled conditions on a fracture table and a single hip spica applied for a successful reduction.

Comminuted intercondylar and supracondylar fractures are among the most difficult to treat, slowest to heal, and have the longest rehabilitation period of all the fractures we have to deal with.

Of this group a recent series studied at Minneapolis General Hospital, including both open and closed method, showed an average time of 102 weeks from time of injury and treatment to discharge from active medical care and rehabilitation. These cases had other complications, however.

No effort has been made here to cover dislocations of the knee and patella, ruptures of the quadriceps and patellar tendons, avulsions of the tibial tubercle and collateral ligaments.

Vascular complications should be looked for in dislocations of the knee and in supracondylar and intercondylar fractures of the femur. They are not common, however, in plateau fractures.

Anyone treating the above-cited fractures should be thoroughly familiar with the mechanics of the knee joint that he may be better equipped to see his patient through a long and arduous rehabilitation period with a functional result as the goal.

Medical Progress

Current Status of the Hemophilia Problem

• All that glitters is not gold—likewise, it is now evident that all "bleeders" do not have classic hemophilia. Discovery of at least four precursors of thromboplastin has made possible the recognition of a variety of different forms of "hemophilia." The only satisfactory way to separate most of these conditions is by use of laboratory tests. This article outlines the differentiation of some of these forms, which is important because the treatment and prognosis vary with the different types.

WILLIAM F. WESTLIN, JR., M.D.
STEPHEN D. MILLS, M.D.
CHARLES A. OWEN, JR., M.D.

Rochester, Minnesota

AS RECENTLY as 1952, a paper written on hemophilia would have been concerned with but one disease state. Since that time, several types of hemophilia have been distinguished as separate entities. Unfortunately, various investi-

gators have used different terminologies in describing the hemophilias, and much confusion has resulted.

At the present time, at least four factors required for the formation of thromboplastin have been identified. Deficiency of any one of these factors results in a disease state that may be classified under the general heading of hemophilia. It is important to differentiate these conditions, since treatment and prognosis vary according to the

Dr. Westlin is a Fellow in Pediatrics Mayo Foundation; Dr. Mills is from the Section of Pediatrics and Dr. Owen is from the Section of Clinical Pathology, Rochester, Minnesota.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

nature of the deficiency. This paper will consider only three of the better-understood factors.

The term "hemophilia" is used here in a generic sense. The familiar disease state known prior to

Certain generalizations may be made that aid in the clinical evaluation of a patient.² Bleeding that affects different parts of the body and is not limited to a particular site strongly suggests the

TABLE I. INTERACTION OF FACTORS IN BLOOD CLOTTING

Phase I	
Plasma thromboplastin precursors + platelets	→ thromboplastin (AHG, PTC, PTA)
Phase II	
Thromboplastin + prothrombin complex* + calcium	→ thrombin
Phase III	
Thrombin + fibrinogen	→ fibrin

*Prothrombin complex = prothrombin, labile factor, stable factor and Stuart factor.

1952 as "hemophilia" will be referred to as "classic hemophilia."

Coagulation of Blood

Consideration of the nature of the hemostatic system is necessary for an understanding of the hemophilias; this system consists of the blood-clotting mechanism, the blood platelets and the vascular network.

A possible order of interaction of the factors concerned in blood clotting is indicated in Table I.

In the first phase of coagulation, the three circulating plasma proteins that have received the most study to date, namely antihemophilic globulin (AHG), plasma thromboplastin component (PTC) and plasma thromboplastin antecedent (PTA), react with the platelets to form thromboplastin.

In the second phase, thromboplastin reacts with prothrombin in the presence of calcium and three accessory factors, namely labile factor, stable factor and Stuart factor, to form thrombin.

In the third phase, thrombin and fibrinogen interact to form fibrin.

Other factors, including natural anticoagulants,¹ enter into the coagulation mechanism, but these are poorly understood at present.

Clinical Recognition of a Hemorrhagic Diathesis

The physician is usually consulted because the patient has one of the following signs: excessive bleeding after minor trauma or dental extraction, easy bruising, purpura, bleeding from the gums or nose, menorrhagia or hematuria. A history of persistent bleeding after tonsillectomy may be present. Sometimes, the only complaint is of swollen painful joints.

possibility of a generalized hemorrhagic state. So also does a history of abnormal bleeding that dates back to early childhood or is of long duration. If a similar bleeding tendency is present in one or more blood relations, an inherited hemorrhagic diathesis must be considered a likely possibility.

Although a carefully taken history is essential in arriving at a diagnosis, care must be observed in evaluating the patient's description of his bleeding tendency. Many normal children are reported by their parents to bruise easily, so that such a history may mean little. It is also common for many normal people to bleed for several hours after dental extraction. However, continuous bleeding from a tooth socket for 48 hours or more, in the absence of a local cause, should be viewed with suspicion. A patient who has required a transfusion after dental extraction must be considered to have a hemorrhagic disorder.

It is common, also, for bleeding to persist for several hours after operations on the nose and throat, but this should not continue beyond twenty-four hours without arousing suspicion.

Hemorrhage into the joints or tissues that occurs in the absence of significant trauma usually signifies a hemorrhagic state.

Because many of these conditions are hereditary, the family history is extremely important. Careful questioning regarding the existence of any bleeding tendency in each member of the family for several generations often is revealing. For example, if several females in one family are involved, the diagnosis is almost certainly a deficiency of plasma thromboplastin antecedent (PTA).

Clinical findings often help to differentiate the purpuras from disorders of coagulation.² The

presence of purpura is suggested by the occurrence of spontaneous bleeding from mucous membranes and of petechiae and ecchymoses in the skin. This type of bleeding ordinarily does not occur in the clotting defects. The hemorrhage that takes place as a result of defects in the coagulation mechanism usually is related to trauma and is not limited to the skin and mucous membranes. Hemorrhage following trauma may persist for days or weeks. Large hematomas may result from bleeding into the tissues, and hemarthroses are common. The same clinical picture may be found in all the severe clotting disorders, so that identification of the specific defect must be made by other means.

Classic Hemophilia

This is sometimes called "hemophilia A." Two variations of this disorder occur and will be referred to as "mild" hemophilia³ and "vascular" hemophilia.

Classic hemophilia results from severe deficiency of antihemophilic globulin (AHG). It is inherited as a sex-linked mendelian recessive characteristic. The female acts as a carrier, and she is asymptomatic. Half of her sons will have the disease and half of her daughters will act as carriers. Methods to detect the existence of the carrier state are presently under investigation.^{4,5}

The earliest manifestation of the disease may be severe bleeding after circumcision, although many hemophiliacs appear to tolerate this procedure without difficulty. Hemarthroses, although not pathognomonic of hemophilia, are a characteristic manifestation. The joints become swollen, tender and painful. Repeated episodes may result in ankylosis and crippling. Bleeding may occur into the skin and muscles, producing painful hematomas. Although not so common, hemorrhage may involve the liver, kidneys, gastrointestinal tract and central nervous system.

With the advent of more sensitive diagnostic tests, it has become apparent that all gradations of AHG deficiency occur, ranging from the classic type with none or extremely limited amounts of this protein to mild forms of the disease associated with levels of AHG ranging from 5 to 10 per cent of normal.⁶ Hemarthroses are rare in mild hemophilia. The presence of these mild forms usually is discovered after trauma or surgical procedures such as tonsillectomy or dental extraction have resulted in severe hemorrhage.

"Vascular" hemophilia is a poor term because

it may mean entirely different things to different people. In this paper, the term is used to designate a disease state typified by a combination of a deficiency in antihemophilic globulin and a vascular defect consisting of coiled, tortuous vessels that fail to constrict normally after trauma.⁷ It appears to be transmitted as a mendelian dominant and occurs in both males and females. Severe epistaxis often occurs, as well as hemorrhage following trauma or surgical procedures. Management of these patients is complicated by the presence of the associated vascular abnormality.

The unqualified term "pseudohemophilia" has been used for patients with the vascular defect and normal coagulation,⁷ whereas "pseudohemophilia B" has been used for the variant with abnormal coagulation.

Deficiency of Plasma Thromboplastin Component (Hemophilia B)

In 1952, Aggeler and associates⁸ and Schulman and Smith,⁹ in the United States, and Biggs and co-workers,¹⁰ in Great Britain, described a new disease clinically resembling hemophilia that could be corrected by the administration of hemophilic blood. The British workers termed the condition "Christmas disease," after the first patient who was recognized to have the disease in England. Aggeler's group introduced the term "plasma thromboplastin component (PTC)" to identify the previously undescribed clotting factor. They stressed the stability of the factor on storage, its high concentration in normal and hemophilic serums, and its ready adsorption on barium sulfate. Deficiency of PTC slows the generation of thromboplastin and reduces the quantity of thromboplastin formed. It has been suggested that PTC may act as a catalyst or an enzyme. It is possible that antihemophilic globulin is the precursor of plasma thromboplastin and that PTC is a cofactor essential for its rapid production.

Christmas disease appears to be inherited as a sex-linked recessive, as is classic hemophilia. It comprises about 15 per cent of all cases of hemophilia. This form of the disease cannot be distinguished from classic hemophilia on clinical grounds, and the results of routine laboratory tests are identical in the two conditions. Therefore, special laboratory procedures are necessary for identification of the specific deficiency.¹¹

The differentiation of AHG and PTC deficiencies is extremely important clinically. The pa-

tient who has classic hemophilia requires large volumes of fresh blood or plasma administered frequently in order to obtain a sufficient concentration of AHG to allow coagulation to occur. The patient with a deficiency of PTC, on the other hand, will obtain a good response from smaller volumes of blood, and the blood does not have to be fresh, because of the stability of PTC. Transfusions are needed less often in a deficiency of PTC because this factor appears to be effective for 10 to 15 days after transfusion.

Deficiency of Plasma Thromboplastin Antecedent (Hemophilia C)

In 1953, Rosenthal and associates¹² identified a third type of hemophilia characterized by a deficiency of a plasma factor other than antihemophilic globulin and plasma thromboplastin component. The disease occurred in three members of one family, two of whom were females. They named the new clotting factor "plasma thromboplastin antecedent (PTA)" and determined that it was present in plasma treated with barium sulfate (unlike PTC) and also in normal serum (unlike AHG). It appears to be inherited as a mendelian dominant. The incidence of deficiency of PTA is not known, but it may be a frequent form of hemophilia.

Because the hemorrhagic manifestations appear to be relatively mild and the clotting times not extremely prolonged, this deficiency may escape detection for long periods. The disease may be first manifested by excessive bleeding after dental extractions or other minor surgical procedures.

Like PTC, the factor PTA also is stable, and stored blood or plasma may be used for treatment or prophylaxis. However, despite its stability, the effect of PTA may last only one or two days after transfusion.

Laboratory Studies

Certain clinical laboratory tests are used in the evaluation of any hemorrhagic condition. The first step is to determine whether a patient with a bleeding tendency has a defect of coagulation or abnormality of the capillaries with or without thrombocytopenia. The preliminary examinations usually ordered include a platelet count, bleeding time, tourniquet test and a coagulation time of whole blood. If results of these first three tests are normal, capillary function may be considered

normal and thrombocytopenia is absent. If the clotting time of whole blood is prolonged, the patient has a defect of coagulation.

Pronounced prolongation of the clotting time is found in severe forms of hemophilia, but the time may be normal when the disease is mild. A concentration as small as 1 per cent of the normal amount of antihemophilic globulin may be sufficient to produce a normal clotting time.¹³

Prothrombin Time.—Once it has been established that a patient has a coagulation defect, it is necessary to determine the type of defect. It is convenient to divide these disorders into two categories based on the results of the one-stage "prothrombin time" test.

The one-stage prothrombin time is abnormal in deficiencies of fibrinogen, prothrombin, factor V, factor VII and the Stuart factor. The methods used to differentiate deficiencies in the prothrombin complex or fibrinogen will not be considered in this presentation. The one-stage prothrombin time is normal in classic hemophilia, and in PTC and PTA deficiencies.

Prothrombin Consumption.—In those patients who have normal clotting and prothrombin times in whom a deficiency of one of the factors in the first phase of coagulation (AHG, PTC, PTA) is suspected, the prothrombin-consumption test may be used.¹⁴ This test is a means of indirectly measuring the amount of available thromboplastin in the blood. Pronounced impairment of prothrombin consumption occurs in classic hemophilia, but the consumption may be normal in mild forms of the disease.

Thromboplastin Generation.—The most sensitive procedure available today for detecting defects in the formation of thromboplastin is the thromboplastin-generation test. This method gives a direct expression of the thromboplastin formed during coagulation. It is possible to detect levels of AHG less than 10 per cent of normal. Since bleeding rarely occurs with greater concentrations of antihemophilic globulin, this test assumes considerable significance. The method is affected by deficiencies of labile and stable factors; therefore, the prothrombin time also must be determined in order to interpret correctly the results of this test.

Mutual-Correction Procedures.—Special tech-

niques or procedures are necessary to identify the specific thromboplastin precursor substance involved in a hemophilic state. One of the most commonly employed procedures is to test for mutual correction in mixtures of plasma or blood from the patient and from persons with known deficiencies. Because it is necessary to have available a supply of plasmas with known defects, this method is limited primarily to larger medical centers.

If one recalls that normal plasma contains all three of the precursors of plasma thromboplastin under consideration, that normal serum contains PTC and PTA, and that plasma adsorbed with barium sulfate contains AHG and PTA, another method of differentiation becomes obvious. It can be seen that a deficiency of PTA will be partially corrected by either normal serum or adsorbed plasma, that a deficiency of AHG will be corrected by adsorbed plasma but not by serum, and that a deficiency of PTC will be corrected by normal serum but not by adsorbed plasma.

Treatment

Although knowledge of the various factors concerned in coagulation has increased greatly in the past few years, little change has occurred in the treatment of severe classic hemophilia. Today, as it was twenty years ago, the chief therapeutic agent is still whole blood or plasma. The goal in the management of an episode of bleeding is to use enough plasma to keep the concentration of AHG high enough to allow hemostasis and healing to take place. Except in an emergency, it is preferable to use fresh, freshly frozen, or freshly lyophilized plasma. When these agents are not obtainable, the freshest available banked blood may be used.

It is generally accepted that AHG is more stable in banked blood than was formerly believed. Therefore, blood banked under modern conditions or plasma is probably acceptable in the treatment of classic hemophilia for several days after it has been drawn. It is best to use fresh whole blood only in those situations in which excessive loss of blood has occurred, or if anemia is present. Special lyophilized preparations of AHG are more expensive than plasma but they have the advantage of indefinite stability and immediate availability regardless of the group of the patient's blood.

The amount of plasma required to correct the

coagulation mechanism in the patient cannot be determined accurately by any common laboratory test presently available. However, it has been determined that the presence of 10 to 20 per cent of normal plasma in hemophilic plasma is required to correct the thromboplastin-generation test.

Treatment varies according to the severity of the hemorrhage. In the management of severe hemorrhage or hemorrhage into vulnerable regions such as the central nervous system, it may be necessary to administer plasma in initial doses as large as 10 ml. per kilogram of body weight.¹³ Thereafter, the amount and frequency of administration should depend on the patient's clinical condition; the physician must remember that the antihemophilic effect of a transfusion lasts less than twenty-four hours.

When the bleeding is not severe, as in hemarthroses, a single daily transfusion of 5 to 10 ml. of plasma per kilogram may be sufficient. Sometimes only cold applications are necessary in the treatment of localized subcutaneous hemorrhage not associated with pain or anemia. In the treatment of children, every effort should be made to avoid the development of crippling physical and psychologic sequelae. The patient or his parents are often able to advise the physician as to what to expect during any episode of bleeding and to judge whether vigorous or conservative treatment is required.

Local measures, although of limited value, are often beneficial. Ice packs may be used for hemarthroses and localized subcutaneous hemorrhage. Injection of hyaluronidase into a joint may facilitate absorption of blood. Evacuation of a hematoma occasionally is necessary; in such cases, a transfusion of plasma should be given prior to the procedure. Local hemostatic agents such as gelfoam and topical thrombin have limited usefulness in open wounds after dental extractions or small cutaneous lacerations. It is unwise to use sutures or to cauterize. However, molded devices to "splint" the gums may be useful.

Antibodies against AHG develop in about 5 per cent of hemophiliacs, and these patients become refractory to treatment. When this occurs, two alternatives are possible, namely (1) the patient should not be given another transfusion but should be given washed erythrocytes to replace the lost blood until bleeding eventually stops through healing of the wound, or (2) he should be given massive doses of plasma at the onset of any hemor-

rhage with the hope of diluting and neutralizing the antibodies. However, the latter course invariably provokes an even higher titer of these antibodies. Total exchange transfusion has been suggested as theoretically helpful; however, its effect has been evanescent, and the antibodies have reappeared quickly.

The question arises whether hemophiliacs should receive prophylactic transfusions of plasma between episodes of hemorrhage. Some hematologists consider that treatment with plasma every day, or several times a week, is warranted in order to prevent hemorrhagic phenomena.¹⁵ Others consider that not only is such treatment difficult from a technical standpoint but that a potential hazard exists in the development of a refractory state.¹⁵ In addition, the tendency to hemorrhage in some patients so treated has not been completely controlled even with daily transfusions of plasma. However, all agree that preoperative preparation with plasma is essential for even the most trivial of surgical procedures.

It is important to enlist the co-operation of an orthopedist in order to prevent crippling deformities. Physical therapy should be instituted as soon as the bleeding ceases.

Although steroid hormones are of no value in the treatment of hemophilia, Schulman and associates¹³ considered that the oral use of prednisone daily for one week after control of bleeding into a joint aids in reducing spasm and periarticular inflammation and speeds the return of function.

Summary

Hemophilia no longer is considered to be a single disease entity. Deficiencies of the presently recognized precursors of plasma thromboplastin, namely antihemophilic globulin, plasma thromboplastin component and plasma thromboplastin antecedent, give rise to a variety of diseases. Recognition of the type of defect of coagulation that is present is important because treatment and prognosis vary according to the nature of the defect. Laboratory studies are of great importance in differentiating the various hemorrhagic states formerly considered as the disease "hemophilia."

The chief treatment of classic hemophilia and of the more recently recognized variants of this condition remains the administration of whole blood or plasma.

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Continuation Study

Diseases of the Esophagus

JAMES B. CAREY, M.D.
Minneapolis, Minnesota

THE CIRCUMSTANCES which impel investigation of the esophagus are, of course, the assertion by a patient of difficulty with swallowing or, in general, any hindrance to the transit of food or liquid from mouth to stomach.

The common complaint of the sensation of a lump in the throat is not truly a disturbance of deglutition but, rather, arises from continuous, repetitive attempts to overcome spasm of the cricopharyngeal sphincter. This is a manifestation of an anxiety tension state, and the spasm may be readily demonstrated through the fluoro-

Successful treatment of difficulty in swallowing calls for accurate diagnosis and ingenuity in treatment; many patients may be helped.

scopic screen when the patient swallows a spoonful of thick barium paste.

Disease of the mouth, tongue, pharynx, or larynx may cause pain with swallowing. Dysphagia may be associated with arthritis of the temporomandibular joint; cleft palate; tetanus; paralysis of the muscles of the face or pharynx by disorders of the VII, IX, XI, or XII cranial nerves; bulbar palsy; or myasthenia gravis.

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Dr. Carey is Clinical Associate Professor of Medicine, University of Minnesota, Minneapolis, Minnesota.

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DISEASES OF THE ESOPHAGUS—CAREY

Dysphagia owing to impediment in the esophagus is usually accompanied by regurgitation of food or liquid and rumination or vomiting without nausea; sometimes, bad breath or taste is noted. Esophageal disease usually produces discomfort in the substernal region or high in the epigastrium and is associated with eating, drinking, swallowing, or is related to body position. The discomfort may be described as soreness or a burning sensation or actual pain. The pain may spread through the chest and extend to the back, the neck, the jaw, or rarely, the shoulder or arm. Pain of esophageal origin that extends to the lower arm is felt in the area of distribution of the ulnar nerve and arises from the lower esophagus, near or at the diaphragmatic hiatus.

A *diverticulum* may be one of two types: traction or pulsion. A traction diverticulum is produced by inflammatory disease outside of the esophagus that, by adhesion, pulls small sections of the wall of the esophagus into pouches. Because of affection (usually tuberculosis) of the glandular structures of the neck and mediastinum, these pouches are in the cervical and upper or middle thoracic regions. They ordinarily have funicular shapes and are broadest at the opening. The walls are composed of all the coats of the esophagus, mucosa, muscularis, and mediastinal connective tissue. Fistulas or free perforations may form from these defects. Commonly traction diverticula are symptomless.

A pulsion diverticulum is a globular, baglike protusion through a weak place in the esophageal wall. The opening is smaller than the dependent pouch, situated at the juncture of the pharynx and the esophagus, less often at the region of the bifurcation of the trachea or the crossing of the aorta, or just above the diaphragm. These are the sites of normal narrowing of the esophagus and also of weakness of the muscle. The walls of pulsion diverticula are composed of mucosa and connective tissue only.

With diverticula, the difficulty of swallowing is at first noted with liquids. If retained food and secretions cause inflammation of the adjacent esophageal wall, solids may also stick. Dysphagia usually consists of regurgitation of liquid at the time of swallowing or soon after, often with choking. With stricture from malignant disease or other cause, the initial and major difficulty is from solid food. Diverticula of the cervical segment

of the esophagus may grow large and be visible or palpable in the side of the neck.

Roentgenoscopic or roentgenographic examination of the esophagus during or after the swallowing of a thick paste of barium mixed with water and acacia will disclose a diverticulum. If constriction is extensive at the site of the pouch, esophagoscopy examination may be necessary to ascertain the possible existence of carcinoma, with ulceration and accessory pocket.

A cervical diverticulum is satisfactorily treated by single or two-stage surgical excision. Epiphrenic diverticula (usually small) may also be excised or obliterated. For patients with diverticula in the middle sector of the esophagus, instructions to eat semisolid food slowly and carefully are usually sufficient.

Carcinoma is commonly found in the middle or lower parts of the esophagus and, in men, is most often seen at the distal end of the gullet. Cancers in the upper regions are predominantly squamous-cell type; those in the lower esophagus are often adenocarcinomas. The squamous carcinomas are very malignant and rapidly produce stenosis. Cancers evoke both difficult and painful swallowing, first of solid, then of semisolid foods and finally of liquids. Pain is substernal and occasionally extends to the back. Ulceration, hemorrhage and perforation may be anticipated. Because of the compulsory restriction of food intake, weakness and weight loss are notable early and are rapidly progressive.

The diagnosis of cancer of the esophagus is commonly and readily made by roentgenographic methods. Esophagoscopy examination may be done when the defect is not characteristic and, in any case, may be desirable for the purpose of biopsy. Bronchial carcinoma may invade the esophagus.

Treatment in most cases is palliative. Some cancers are accessible surgically and may be resected. High-voltage or cobalt radiation has been used in some instances. Carcinomatous strictures may be dilated by bougies passed by mouth. The condition is usually fatal within five to nine months; metastasis is found in about 60 per cent of cases by postmortem examination.

Sarcomas of the esophagus and benign tumors (such as papillomas, polyps, fibromas, and similar growths) are occasionally responsible for symptoms and often necessitate esophagoscopy study with

biopsy to establish the nature of the filling defect found by roentgen examination.

Strictures of the esophagus are the consequence of inflammation and ulceration caused by caustic and corrosive substances, frequently swallowed accidentally by children. There is great pain and inability to swallow immediately after the insult. Then, symptoms usually subside, with later return of dysphagia without pain as stenosis develops. Most strictures may be successfully dilated. The esophagus should be intubated, preferably by an intranasal plastic tube, soon after the accident when acute mouth and pharyngeal inflammation has subsided. The tube is left in place to permit feeding, prevent complete closure, and allow subsequent passage of dilating bougies.

Chronic or recurrent esophagitis may also lead to benign stricture. The names given to this condition reflect the uncertainty concerning etiology: peptic, ulcerative, erosive, reflux, regurgitative, nonspecific. Despite some doubt, irritation of the lower esophagus by gastric juice appears to be accepted as the immediate cause. The gastric contents may get into the gullet intermittently from frequent vomiting or may bathe the esophageal mucosa almost continuously because the restraining effect of the cardia is faulty or lacking. Certainly, the association of esophagitis with gastric and duodenal ulcers, gastric resection, and sliding hiatus hernia is common enough to assume that when gastric juice flows into the esophagus (for whatever reason) inflammation and ulceration of the mucosa ensue. Such changes have been seen by the esophagoscope and found by postmortem examinations.

Esophagitis may produce substernal pain (often when the patient is eating), dysphagia, regurgitation, heartburn and a sensation of pressure. Pain or distress is often more noticeable when in the horizontal position or during stooping or bending. With deep ulceration, pain may extend to the left side of the thorax, posteriorly. The disease may progress to stenosis.

Treatment is planned to prevent reflux of gastric juice or to counteract the deleterious effect of reflux. Frequent feeding of small amounts of nonirritating food, avoidance of bending movements, and sleeping with the head and shoulders elevated usually accomplish the purpose. Antacid preparations between meals and at bedtime are beneficial. Strictures may be dilated. Permanent

stenosis requires surgical consideration. Deep strictures may be excised, and, depending upon location and associated conditions, resection and anastomoses of the esophagus, jejunum, and stomach may be done.

Peptic ulcer of the esophagus forms in the lower part—in the ampulla or vestibule. The ulcer is usually single and is round, oval, or linear, with a sharply defined edge and without much rim. The smooth crater is filled with grey exudate and granulation tissue. In short, the ulcer has the exact appearance of the single benign peptic ulcer of the stomach. Ulcers appear in what Barrett¹ calls "the lower esophagus lined with columnar epithelium." When the patient is eating pain may be noted at the site of the lesion, high in the epigastrium or subxiphoid region, and, occasionally, substernally up to the episternal notch. The pain may extend around the costal margin, through to the back, or to the interscapular region. Burning distress or pain may be felt between meals and is relieved by taking food or alkali. The ulcer may bleed—evidenced by hematemesis or melena—or it may perforate.

Esophagosopic examination may aid in distinguishing a benign from a malignant ulcer. The management consists of small, frequent feedings of nonirritating food, control of acidity by antacid preparations, and relaxation of attendant spasm by administration of tablets of $\frac{1}{2}$ gr. of phenobarbital and $\frac{1}{8}$ gr. of belladonna, three or four times daily. Hemorrhage, perforation, or stenosis require surgical therapy.

Cardiospasm is, as the name implies, a condition of more or less permanent tonus of the cardia and lower esophagus. No true sphincter has been demonstrated at this point, but the musculature is undoubtedly capable of sphincteric action or, perhaps, fails to relax. Greatly increased tone, or inability to relax, is possible by an autonomous mechanism. Smooth muscle in lower forms of life tends to remain persistently contracted when separated from ganglion cells. The only constant, significant abnormality found in cases of human cardiospasm has been diminution in number or entire absence of ganglion cells of the myenteric plexus.

At the onset of cardiospasm, patients have difficulty with swallowing solid food and later refuse even liquids. In the early stages, before the

esophagus has dilated, material is regurgitated in the same state in which it was swallowed. Later, if and when the esophagus has dilated, a considerable quantity of solid food and liquid may be retained for long periods of time, and only upper layers are spilled out of the mouth. The regurgitated material contains no gastric juice but may be changed by fermentation or putrefaction, depending upon the duration of retention. Esophageal mucosa may be inflamed but is seldom ulcerated. Hemorrhage or perforation is rare. Cardiospasm usually is not painful; however, substernal distress or epigastric fullness is occasionally noted. Sudden spasm may be precipitated by emotional disturbance, but a psychogenic basis for chronic cardiospasm is difficult to establish.

Usually a tentative diagnosis of cardiospasm can be made from the story the patient relates. This is later confirmed after seeing the funnel constriction of the lower end of the barium-filled esophagus—by fluoroscope or on x-ray films. The esophagus may be dilated, sometimes enormously, with a pouch lying on the diaphragm. Generally, the outline of the conical constriction is quite smooth and even, but accumulated material may distort the margins of the barium shadow to simulate a carcinomatous defect. In this event, esophagoscopic examination, after thorough aspiration and washing, may be necessary to establish the diagnosis.

Forceful dilation is satisfactory for most patients with cardiospasm. This may be done with air or water-pressure bags passed through the contracted segment. More forceful dilation may be done using a metal instrument with a basket arrangement made of flexible strips at the end that is collapsed until in place, then suddenly and strongly expanded. The purpose of either of these maneuvers is to tear the contracted esophageal muscle. One dilation usually suffices, but more may be necessary. When these methods fail, the Heller cardioplasty, properly done, is satisfactory. This operation is simply a longitudinal incision, 4 to 5 in. (10 to 12.5 cm.), through the muscles of the lower esophagus and the serosa and muscles of the upper stomach, leaving the lining mucosa of each organ intact.

Hiatus hernia is of two types: (1) rolling, or paraesophageal hernia and (2) sliding hernia, which may include the short esophagus type that is the result of chronic esophagitis; congenital

short esophagus is rare. The same elements operate in the formation of both types, with slight differences for each. Paraesophageal hiatus hernia probably occurs in individuals who have, because of structural defects, esophageal openings through the diaphragm larger than normal. Under particular circumstances, small or large portions of the upper stomach may protrude through a weakness of the ring at this point. When the cardia is also incompetent, gastric juice may regurgitate and produce inflammation, fibrosis, and scar contracture, with subsequent shortening and often stricture. This course of events makes a sliding hernia.

Both sliding and rolling hernias are aggravated by thoracic kyphosis, increased intra-abdominal pressure, obesity, coughing, or vomiting. The symptoms are intermittent at first, unless, after a violent paroxysm of coughing or vomiting, a portion of the stomach becomes incarcerated. The patient has dysphagia, regurgitation and pressure sensation or pain high in the epigastrium or under the sternum that may extend to the back. The discomfort is likely to occur when the patient is lying down or after a heavy meal when the stomach is distended or the colon is overfilled. Not infrequently, pain simulates angina pectoris or biliary colic. Bleeding may be notable as hematemesis or melena or be responsible for anemia.

Hiatus hernia is readily discovered by fluoroscopic and roentgenographic examinations of the barium-filled esophagus and stomach. Hernia is not difficult to distinguish from contraction rings of the ampulla. Esophagoscopic examination yields information about the extent of inflammation, ulceration and stricture with the sliding hernia but is not helpful for paraesophageal hernia.

Treatment in the early stages, when distress occurs only at night, with or between meals, or in particular body positions, is the same as that suggested for esophagitis and esophageal ulcer. When symptoms persist or complications arise, surgical correction of the condition is necessary. The operation may be simple repair of the paraesophageal hernia, resection of the diseased esophagus, or excision of a stricture, with jejuno-gastric anastomosis.

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Case Presentations

Virilism Due to Adrenal Adenoma

Discussion of Differential Diagnosis

ROGER P. HALLIN, M.D.
VERNON A. VIX, M.D.
Worthington, Minnesota

Present methods of treatment make possible the satisfactory management of many patients with virilism, but successful outcome depends upon recognition of the syndrome and subsequent determination of the specific etiology. The occurrence is unusual enough so that a report of a single case with urinary steroid studies, and a brief review of the subject seems warranted. Virilism is best defined as an abnormal endocrine state characterized by the symptoms and signs of excessive androgen production.¹

Case Report

Mrs. A. G., a white woman, aged twenty-one, was first seen by our group on October 11, 1951. She presented herself because of failure to menstruate since August 26, 1951. Her history disclosed that menarche had occurred at the age of thirteen years, and regularly occurring menstrual periods were noted until 1950. At that time, the interval between menstrual periods became irregular and menstruation at times occurred as often as every two weeks. Because of failure to menstruate for forty-five days, the possibility of pregnancy was considered. However, two negative frog tests done one week apart and the absence of physical changes of pregnancy as late as October 22, 1951, led

us to dismiss this possibility.

The patient was next seen in June, 1953. The history at that time revealed that her menstrual periods had occurred irregularly until February, 1952, following which menstruation ceased entirely. Complete physical examination including examination of the pelvis was normal except that moderate hirsutism was noted. Laboratory examination disclosed a normal routine urinalysis. The peripheral blood disclosed a hemoglobin of 18 grams, wbc 14,150, neutrophils 70, lymphocytes 26, eosinophils 1, basophils 1, monocytes 2. The BMR was 0%. The patient was not seen again until October 29, 1956.

The patient at this time again presented herself because of amenorrhea dating back to February, 1952. Her only other complaint was easy fatigue. A review of symptoms revealed increased growth of body hair, increased libido and huskiness of her voice all for about one year. Examination showed a masculine type of body configuration. There was acne of the skin of the face and shoulders and the skin generally was coarse and somewhat thickened. Hair growth was masculine in distribution with a heavy growth on the face, chest, abdomen and lower extremities. The blood pressure was 128/84. Her weight and height were 130 pounds and 62.5 inches respectively. No abdominal masses were palpable. Pelvic examination disclosed an enlarged clitoris which measured 2 cm. in length. No abnormalities of the uterus or adnexa were found. Routine laboratory

examination disclosed the following: urinalysis, normal; hemoglobin 15.3 grams; white blood count 8,900; neutrophils 69, lymphocytes 28, eosinophils 2, monocytes 1.

Clinically, it was evident that we were dealing with a virilizing syndrome. Further studies were therefore directed at determining its etiology. A twenty-four-hour specimen of urine collected on November 17, 1956, was found to contain 160 mgm. of 17 ketosteroids. Because of the very high 17 ketosteroid level, difficulty was experienced in obtaining an exact level for the 17 hydroxycorticoids but a level between 6 and 11 mgm. was obtained. This level was considered normal. The Allen test for dehydroisoandrosterone was positive.² Following these reports the patient was placed on hydrocortisone in a dosage of 60 mgm. orally every eight hours for four days. On the fourth day urine was again collected for a twenty-four-hour period. This urine specimen contained 326 mgm. of 17 ketosteroid. These findings were interpreted as indicating the etiology to be a tumor of either adrenal or ovarian origin.

On December 21, 1956, the patient was admitted to the hospital where perirenal injection of air was performed. Roentgenograms disclosed a well defined tumor of the right adrenal gland measuring about 5 cm. in diameter. Following this procedure the patient was discharged and readmitted on January 5, 1957, for excision of the tumor.

The patient was given prophylactic corticoid therapy for thirty-six hours preoperatively. On January 7, 1957, an operation was performed through the bed of the right twelfth rib. In order to obtain more adequate exposure, a section of the eleventh rib was removed. The right kidney was depressed inferiorly and the tumor was easily palpated. It was removed by sharp and blunt dissection. From the medial aspect of the tumor, two small veins entered the inferior vena cava directly. These were ligated and severed. The entire right adrenal gland was removed with the tumor. The patient withstood the procedure well.

On examination, the tumor grossly was soft and fleshy in consistency and had a yellowish brown color which was mottled by areas of hemorrhage. The tumor was oval in shape and measured 68 mm. x 42 mm. x 48 mm. Together with the attached adrenal gland the specimen weighed 70 grams. A well defined intact capsule covered the tumor except that no line of cleavage could be found between it and the attached adrenal gland. Microscopically the tumor was made up of large cells which showed a definite tendency to arrange themselves in cords. The size of the cells varied considerably and occasional mitotic figures were seen. Within the abundant granular cytoplasm of the larger cells brown droplets could be identified. Scattered throughout the tumor were smaller cells with small nuclei and clear eosinophilic cytoplasm. It was the opinion of the pathologist that although the microscopic picture indicated active growth, the tumor represented a benign adrenal adenoma.

Postoperatively the patient did well receiving supportive corticoid therapy. The dose was gradually decreased beginning on the 3rd postoperative day. On the 6th day, following the operation she was discharged. A twenty-four-hour specimen of urine collected on February 6,

1957, showed 10.7 mgm. of 17 ketosteroids. On February 10, 1957, menstruation occurred for the first time since February, 1952. Flow continued for 4 days and was normal in all respects. Normal menstrual periods occurred at regular intervals until June 24, 1957. The patient was seen August 11, 1957, at which time pregnancy was confirmed. On March 20, 1958, following an uneventful labor, the patient gave birth to a normal male infant.

Discussion

Virilism is a symptom complex which is secondary to the excessive production of androgens. The symptoms and signs produced are illustrated by the case presented. The most frequently suspected cases of virilism usually represent "simple" or "idiopathic" hirsutism. This condition is recognized by the fact that it is usually familial, it is common in females whose ancestors originated in the Mediterranean area, and it is not associated with the other symptoms and signs of excessive androgen production. It is unusual for hirsutism to occur as the only sign of excessive androgen production in patients with androgenic lesions of the adrenal gland.¹ The presence of virilism in the patient is the best indicator of androgenic activity,³ but the finding of an elevated urinary 17-ketosteroid excretion is a very valuable confirmatory finding. Urinary 17-ketosteroids represent the degradation products of several different hormones some of which have no known biological activity and others which have no androgenic activity, but it is unusual to observe instances of virilism due to adrenal adenoma with a normal 17-ketosteroid level. In some instances with normal 17-ketosteroid excretion, a distinctly decreased excretion has been noted following appropriate therapy.¹ "Idiopathic" hirsutism is characterized by a normal total 17-ketosteroid excretion leading some observers to postulate an increased sensitivity of the hair follicles to normal amounts of androgens,¹ while other observers have found subtle changes in various fractions of adrenal hormones which they interpret as indicating altered adrenal function as the probable causative factor in many instances.⁴

Virilism can result from a number of different lesions or circumstances all of which have the common denominator of excessive androgen production. The most frequent cause is testosterone administration for such conditions as carcinoma of the breast. In a study of patients receiving 50 mgm. of testosterone propionate intramuscularly daily, which is sufficient to produce the syndrome,

it was found that the urinary 17-ketosteroid excretion was increased approximately 8 mgm. per twenty-four hours.¹ Various methods yield slightly different values for normal 17-ketosteroid excretion, but a representative figure is 6 to 15 mgm. per twenty-four hours.⁵ Because of the wide range of normals, it is thus apparent that in certain instances it is possible for the syndrome of virilism to occur in the presence of a 17-ketosteroid excretion in the normal range.

The spontaneously occurring instances of virilism are the result of androgen producing lesions of the adrenal gland, ovary, or "adrenal rest" tumors which may occur in the ovary and elsewhere in the abdominal cavity outside the normal site of the adrenal cortex.⁶ Virilizing lesions of the adrenal gland include either hyperplasia or tumor which may be malignant or benign. The terminology by which androgen producing tumors of the ovary are recorded in the literature is confusing and no doubt some of the listed lesions represent identical conditions. Those listed include arrhenoblastoma,⁷ Leydig-cell tumors,⁶ luteoma,^{1,6,8} hilus-cell tumor,¹ and the already mentioned adrenal rest tumor. In one instance the occurrence of virilism in an individual during two pregnancies was thought to be the result of hyperplasia of the ovarian lutein cells rather than tumor.⁹

In a patient who shows the stigmata of virilism, physical examination is frequently of no help in localizing the site of the lesion. This is readily understood with adrenal tumors since by virtue of location they must attain considerable size before they become palpable, but it is also true of ovarian lesions which are more accessible to physical examination. Many of the ovarian lesions which produce excessive androgens are small and not palpable on pelvic examinations.^{7,8} Even should a tumor be palpable, one is still faced with the possibility of an incidental tumor rather than a causative one.

Hormone studies are of much value in differentiating adrenal hyperplasia from the other causes of virilism, and must be done in each individual because of the difference in therapy. When the urinary 17-ketosteroid excretion is normal or near normal in the presence of virilism, the cause is most likely to be an ovarian lesion.¹ To carry out hormone studies one should first determine the base line urinary excretion of 17-ketosteroids and follow this with the administration of 10 to 25 mgm. 9-alpha-fluorohydrocortisone daily in divided

doses or equivalent amounts of prednisone, hydrocortisone, or cortisone for a period of four to five days.^{6,10} In the presence of a considerable decrease in 17-ketosteroid excretion following such treatment, one may assume the presence of adrenal hyperplasia and continue with the administration of corticoids in amounts sufficient to keep the ketosteroid excretion at a normal level. It should be added that 9-alpha-fluorohydrocortisone has too great a tendency toward salt and water retention to be used in the required doses for prolonged periods of time, and because of less such tendency prednisone or prednisolone are probably the treatment of choice.¹⁰ It has been recommended that hyperplasia of the adrenal gland should not be assumed unless there is also an excessive increase of 17-ketosteroid excretion in response to stimulation with ACTH.⁶ This has been shown to be true in Cushing's syndrome where the stimulation test with ACTH is probably superior to the inhibition test with corticoids in separating tumor from hyperplasia, but we have been unable to find a single instance of virilism due to adrenal hyperplasia that did not show a significant decrease in 17-ketosteroid excretion in response to administered corticoids. There are reported instances of an increased 17-ketosteroid excretion in response to ACTH stimulation and a decreased 17-ketosteroid excretion in response to 9-alpha-fluorohydrocortisone^{6,11,20} when the lesion was subsequently found to be an adrenal carcinoma. It would seem that in the presence of "pure" virilism with a normal 17-hydroxycorticoid excretion one is justified in assuming the presence of adrenal hyperplasia if a significant drop in 17-ketosteroid excretion occurs following the administration of corticoids with the reservation that should normal excretion levels not be obtained and maintained after a reasonable length of time the case should be reconsidered with the possibility of a tumor kept in mind. In the presence of virilism, should no significant inhibition of 17-ketosteroid excretion occur following the administration of corticoids then the lesion can be assumed to be tumor of either adrenal or ovarian origin. Fractionation of the urinary 17-ketosteroids and determination of the beta or III fraction (dehydroisoandrosterone) may be of help in establishing the presence of a tumor since it is most often elevated under such conditions^{2,12} but it may less frequently be elevated in virilism due to adrenal hyperplasia.³

In the absence of localizing physical findings an

intravenous pyelogram should be done searching for evidence of renal displacement. Following or at the same time the pyelogram studies are done, presacral or perirenal gas injection should be carried out. There has been considerable discussion as to the advisability of doing air studies but with proper precautions this procedure is safe and of much value in localizing adrenal tumors.³¹ Recent work done with pure carbon dioxide indicated that the great solubility of this gas in serum makes it a safe agent to use as a contrast medium for tissue injection.¹⁷ Indeed, doses upto 100 cc. have been injected intravenously into humans for intracardiac visualization and comparably larger amounts into animals without adverse effects. False positive tumor shadows or confusing pictures can at times occur.⁷ Should none of these procedures localize the lesion, then pelvic exploration is necessary for direct examination of the ovaries. In the absence of an ovarian lesion the more formidable exploration of the adrenal glands must be carried out. It should be mentioned that some individuals prefer to omit gas studies and proceed with exploration of the ovaries and adrenal glands all in one surgical procedure.¹⁴

The results of treatment have been gratifying except in those instances due to adrenal carcinoma.¹⁵ Prolonged therapy with corticoids is necessary in the presence of adrenal hyperplasia. Even after the removal of an adrenal adenoma the masculinizing changes induced by the tumor are not all reversible. The occurrence of pregnancy following the removal of a virilizing adrenal tumor as in the reported case is an unusual event; however, several other similar cases have been reported in the literature.^{15,16,18,19}

Summary

A patient with virilism due to adrenal adenoma is presented. Six months following removal of the tumor pregnancy occurred. The differentiation of virilism and "simple" hirsutism is stressed, and the method by which androgen producing lesions can be localized is discussed. Appropriate therapy consists of long-term corticoid administration in the case of adrenal hyperplasia, and surgical removal in the case of an adrenal or ovarian tumor.

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Fatal Adrenal Cortical Failure Following a Medical Emergency

Patient Previously Treated with Cortisone

HERBERT W. JOHNSON, M.D.
BENJAMIN F. FULLER, M.D.
Saint Paul, Minnesota

IT IS now generally accepted that the use of either ACTH or cortisone may result in diminished adrenal cortical function without clinical manifestations occurring until the organism is subjected to stress. To date, several fatalities have been reported which occurred during the immediate postoperative period, and in which it was felt that acute adrenal insufficiency resulting from the prior use of cortisone was responsible for the deaths.^{1,2,3}

Inasmuch as the above-mentioned fatalities followed a surgical procedure, we feel that it is of importance to report the occurrence of death in a case in which the basic etiologic factor was the same but in which the stress factor was a medical emergency rather than a surgical procedure.

Case Report

A man, sixty-six years of age, was first seen by us three days before his death. He had had asthma for twenty-five years, but the attacks were not frequent or disabling. During the past five years he had received intermittent desensitization treatment for his asthma. One year before his death he had a severe asthmatic attack and had been placed on cortisone. The cortisone was continued in a relatively small dose 25 to 50 mg. daily—for the ensuing year.

Two weeks before admission to the hospital, he developed edema of the legs and increasing dyspnea. The cortisone was discontinued and the edema and dyspnea disappeared. Five days before his death, he again developed edema and dyspnea. He was admitted to the hospital three days before his death. It was at this time that we first saw him in consultation. His blood pressure was 112 mm. Hg. systolic and 70 mm. Hg. diastolic. The pulse was 108 per minute. Marked

emphysema secondary to chronic asthma was present. Moist inspiratory rales were present in the lower one-third of both lung fields. There was marked dyspnea and moderate cyanosis of the nails and lips. Examination of the heart revealed a regular rhythm. No murmurs were present. Pitting edema was present in both legs to midway between the ankle and knee. The remainder of the examination was not remarkable.

The patient was digitalized with 1.2 mg. of digitoxin orally over the next two days and placed on a maintenance dose of 0.2 mg. of digitoxin daily. One cc. of mercurhydrin was given intravenously. A good diuresis resulted. He was carefully given intermittent oxygen and carbon dioxide by mask with beneficial results. The following day a rapid irregular heart rate was noted. An electrocardiogram showed a nodal tachycardia of 170 beats per minute but was otherwise non-specific. The lungs were now clear to auscultation and percussion except for scattered ronchi. Quinidine was administered, and there was a gradual return to a regular rhythm and a slowing of the pulse to 90 beats per minute. The patient's condition remained unchanged over the next eighteen hours. Following this there was a gradual increase in pulse rate, and the temperature rose to 99° F. orally. Pulmonary edema recurred. Two cc. of mercurhydrin was given intramuscularly. The blood pressure began to fall slowly to a level of 36/0. The patient became unresponsive and expired.

At postmortem examination the heart weighed 500 gm. There was hypertrophy of the wall of the right ventricle. The endocardium, myocardium and epicardium were normal. The coronary arteries showed very little sclerosis and all of the valves were normal. The lungs weighed 1,500 gm. There was diffuse congestion and edema in both lungs but most marked in the lower lobes. There were no pneumonic consolidations present. Emphysematous blebs were present in the right lower lobe. The adrenal glands were atrophic; however it was impossible to obtain an accurate weight

of the adrenal glands since the surrounding fat was so adherent that it could not be completely separated. It was estimated that the combined adrenal weight was about 4 gm. or 50 per cent of normal. The cortex of each adrenal was thinner than normal and greyish-brown in color instead of the usual orange. The spleen, liver, gastrointestinal tract, pancreas, lymph nodes, spine and genitourinary tract were normal. Unfortunately permission to explore the skull was not given.

Microscopic examination of the adrenal cortex revealed that the narrowing of the cortex was due to loss of lipid material. There was no demonstrable decrease in the number of cells in the adrenal cortex. A Sudan IV stain showed a marked loss of lipid material throughout the three layers of the cortex but especially marked in the outer half of the cortex. The medulla was normal.

Comment

This patient had received a relatively small dose of cortisone over a prolonged period of time. The depletion of adrenal cortical lipid material and atrophy of the adrenal cortex as described in this case are identical with those reported by Salassa *et al*² in their study of the alterations in adrenal glands following the use of cortisone. Studies by Bennett *et al*⁴ indicate that the administration of cortisone for a period of five or more days in a total dose of as little as 450 mg. may lead to microscopic evidence of adrenal cortical atrophy.

It is our feeling that there were two factors which accounted for the precipitation of acute adrenal cortical failure in this case. The individual as a whole and the atrophied adrenals in particular had been subjected not only to the stress of cardiac failure presumably accelerated by the salt-retaining ability of cortisone, but also to a potent diuretic with its attendant loss of sodium. It may be postulated that the loss of sodium caused by the diuretic was sufficient strain to precipitate acute adrenal failure in an already damaged adrenal gland.

The frequent use of cortisone and the even more common use of diuretics in medicine today will undoubtedly cause similar situations to arise again. The physician must be alert to this possibility when tachycardia, slight fever and falling blood pressure occur in such a patient. This triad of symptoms—tachycardia, falling blood pressure and slight fever, in the absence of other causative factors—is the first indication of acute adrenal cortical insufficiency. Unfortunately, the above-mentioned signs are not especially helpful from a differential diag-

nostic point of view in the cardiac patient. It would seem that the syndrome would have to be suspected if the cardiac patient's condition appeared to be getting worse in spite of good control of the fundamental cardiac problem.

It should be emphasized that at the time of this patient's death, he was relatively well compensated from a cardiac standpoint. The lungs were clear to auscultation until shortly before death, no hepatic enlargement existed and there was no peripheral or presacral edema apparent. These findings were in marked contrast to those present when he was admitted to the hospital. It should also be emphasized that the patient was not on a low sodium diet prior to his admission to the hospital nor had he previously received mercurial diuretics. Therefore it is unlikely that a low sodium syndrome existed.

It is suggested that the stress associated with severe medical illness may precipitate acute adrenal cortical failure in patients who have previously received cortisone. This is more likely to occur in patients suffering from diseases which necessitate the use of diuretics with their attendant loss of sodium.

Summary

A death due to acute adrenal cortical insufficiency secondary to the use of cortisone is reported. The precipitating factor was medical rather than surgical.

Careful consideration must be given to the potential hazard of acute adrenal cortical insufficiency in patients who have received cortisone and in whom salt-losing diuretics must subsequently be used.

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Editorials

JOHN F. BRIGGS, M.D.
ARTHUR H. WELLS, M.D.
HENRY G. MOEHRING, M.D.

ACID-FAST BACILLI

Importance of Their Proper Classification

In Bergey's Manual of Determinative Bacteriology (1948), the genus *Mycobacterium* is considered to include acid-fast bacteria that have no true mycelium or spores. In addition to the few well-known acid-fast bacilli such as *Myco. tuberculosis* and *Myco. phlei*, there are acid-fast microorganisms that obviously belong in this genus but that have not been described sufficiently to give them a species name. These are listed as *Mycobacterium species* (*sp.* for singular and *spp.* for plural). Why call such microorganisms "atypical acid-fast bacteria" when an accepted scientific term exists for them, namely *Mycobacterium sp.*?

It is proposed here that the term "atypical acid-fast bacteria" be discontinued and that *Mycobacterium spp.* be used for unidentified acid-fast bacteria. A plea is also made for complete and detailed bacteriologic studies on cultures of *Mycobacterium spp.* of whatever source. Accounts of isolating "atypical acid-fast bacteria," "yellow bacillus" or "chromogenic acid-fast bacteria" are meaningless if the bacterium in question is not described sufficiently to distinguish it from other known members of the genus *Mycobacterium*.

A cursory review of the literature reveals that the group of acid-fast bacteria has been neglected taxonomically. The situation is still chaotic. It is natural that the early workers were concerned primarily with the tinctorial resemblance to tubercle bacilli of certain microorganisms that were not pathogenic for experimental animals. These organisms have been recovered from lesions and exudates of man and animals as well as from soil, water and various foods. To emphasize their similarity to tubercle bacilli and to give them some sort of designation, they have been lumped into categories such as "tubercle bacillus-like bacteria," "pseudotubercle bacilli," "paratubercle bacilli," "saprophytic acid-fast bacilli" and, more recently, "atypical acid-fast bacteria." The term "paratubercle bacilli" is still used in some European literature. Some authors recognize that this is inadvisable because of confusion with *Myco. paratuberculosis*, the cause of hypertrophic enteritis in

cattle. In some papers, the term "saprophytic acid-fast bacteria" is used for all forms other than the recognized pathogenic species. This is unfortunate since some of these actually may be parasitic. Certainly, some of the parasitic forms can exist and grow saprophytically.

Hundreds of different *Mycobacterium spp.* have been isolated from various sources. In some instances, they were given common names to indicate their origin, such as "butter bacillus," "grass bacillus" and "manure bacillus." Fortunately, there are but few eponymous terms such as Stefansky's bacillus or Friedman's bacillus, each of which is a well-known species of *Mycobacterium*. Descriptions in the literature of various *Mycobacterium spp.* are usually so meager that it is not possible to classify them or to compare the report of one worker with that of another. In one inventory of *Mycobacterium spp.*, it was proposed to number the strains in the alphabetic order of the authors, since it was not possible to classify them on existing information. The list up to 1945 included 163 numbered strains.

Of particular interest is a recent study of 195 strains of *Mycobacterium spp.* collected from various laboratories. Many of the cultures had been given names, such as *Myco. phlei* and *Myco. butyricum*. Most were properly called *Mycobacterium spp.* When these organisms were subjected to a large number of tests, it was found that many of them were alike. Each of one group of 57, in which there were 15 different names, was found to be *Myco. smegmatis*. A total of 28 strains, including 18 isolated from patients, were identified as *Myco. fortuitum*. One of these had been called *Nocardia sp.* Thus, adequate examination of these microorganisms permitted proper classification instead of lumping them into such wastebasket categories as "paratubercle bacilli" or "atypical acid-fast bacteria."

The changes in names of bacteria continue to baffle physicians, to say nothing of the consternation aroused among bacteriologists. Each discipline of science has an organized plan for creating descriptive and useful nomenclature to meet its particular needs. Organic chemicals are named ac-

cording to rigid rules; botanists and zoologists are guided by authoritative codes of nomenclature. For bacteriology, an International Committee on Nomenclature exists that provides rules for assigning a microorganism to a genus and giving it a specific name. A scientific designation has universal validity if it is made according to rules. Every bacteriologist can recognize certain characteristics of a microorganism by its name alone.

Certain common names of microorganisms have usefulness, such as "pneumococci" for *Diplococcus pneumoniae* and "tubercle bacillus" for *Mycobacterium tuberculosis*. Also, there is common scientific jargon, such as the chemists' "gunk" for amorphous unidentified stuff. The term "atypical acid-fast microorganism" should be recognized as useful jargon for informal discourse. However, the organisms included under *Mycobacterium spp.* are not atypical. Each species of *Mycobacterium* is typical of its own kind. Microorganisms should not be discarded into wastebasket categories just because they do not appear to be typical of allegedly more important kinds. A culture of *Mycobacterium sp.* isolated from sputum, exudates, lesions or any other source should be adequately studied and properly named. It should not be called "atypical" merely because it does not resemble *Mycobacterium tuberculosis*.

ALFRED G. KARLSON, PH.D.

Dr. Karlson is in the Section of Bacteriology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

EDUCATIONAL TELEVISION

The Background

On May 11, 1953, the first non-commercial educational television station in the United States broadcast its first program. More than four years later KTCA-TV in Minneapolis-St. Paul, became the twenty-fifth such station in the country. Since that time six more such stations have come on the air and it is expected that in the next three years another twenty such stations will be started, including one at Duluth. These stations came into being as a result of a need expressed by many eminent citizens before the Federal Communications Commission in 1951 and 1952 which culminated in the FCC reserving VHF and UHF channels for non-commercial educational use in April, 1952.

The financial costs of establishing an Educational Television station have varied from a low

of about \$150,000 to a high of \$900,000.00. The costs in terms of time and effort on the part of interested citizens in the places where such stations have been activated are, if anything, even greater. Annual costs for operating Educational Television stations vary from about \$100,000.00 to \$800,000.00 per year. Again much time and effort by many people must go into such a station operation.

In view of the costs listed above and the difficulties of television production generally, a reasonable man might well inquire as to the justification for these activities and expenditures. What contribution can Educational Television make to the areas in which it operates which has caused these communities to invest so heavily in it?

One of the first and most compelling reasons for the establishment of these stations is contained in two of the most important facts of our time. The first is that in a short twelve years, by 1970, all classes from the kindergarten to the graduate school in this country will have, on an average, twice as many students as we have today. This is not theory. The freshman class in 1970 now averages six years of age. They are here. The children who will bulge our seventh grade classrooms in 1970 were born in 1957.

The second sobering fact is that there is no way in the world that we can double the number of qualified teachers in this short period of time.

Taken together, these facts mean that we must either extend the reach and scope of our teachers or we must resign ourselves to half-day schools, ill-qualified teachers, and in sum, to the negation of the American dream that all who are qualified to benefit from education should have an opportunity to receive it. Obviously, educational television has the ability to extend the teaching of the excellent, well-qualified teacher beyond the thirty or forty in the classroom to 30,000 or 40,000. In fact, in Pittsburgh, St. Louis, Houston, Birmingham, San Francisco and a score of other areas this has already been done. Potentially, the thirty or forty thousand who study Psychology in Houston by means of an ETV station and an exceptionally capable professor from the University of Houston could well be (and may be in the near future) 300,000 or 400,000.

Events of recent months have caused all of us to wonder if the quantity and quality of our education is sufficient in certain areas, notably the sciences. The kind and amount of science train-

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ing in the elementary schools has come in for especial criticism. By means of KTCA-TV and a most capable young teacher, 20,000 elementary school children in Grades IV and V in St. Paul and Minneapolis schools are now simultaneously receiving instruction at a very high level in this subject area three times each week.

Questions as to the efficacy of this kind of instruction, as to its quality and its cost have been studied at length all over the United States. The answers to these questions are uniformly favorable to education by television and they will be discussed in succeeding articles.

JOHN C. SCHWARZWALDER

PARTNERSHIP WORKS

Electrical Industry

Partnership between investor-owned electric companies and local agencies in the development of water power resources has been a good thing for both the nation and the taxpayers in the Pacific Northwest.

In that area alone, the Federal Government stands to save a great portion of the three and a half billion dollars—approximately one million dollars a day—it will cost to meet the growing power demands of the region over the next ten years.

Self-reliant, investor-owned electric companies and local agencies are now building more than four million new kilowatts in this region alone, *The Reader's Digest* reported in August. "The local horse is far outstripping the federal horse in the Pacific Northwest as they go into the stretch," the *Digest* said.

In a recent letter to Congressman Jack Westland of Washington, President Eisenhower said:

"Early in my first term I expressed the belief that the nation must adhere to three fundamental policies: first, to develop, wisely use, and thus conserve our country's natural resources from generation to generation; second, to follow the historic pattern of permitting private and other non-federal organizations to develop these resources under fair provisions of law, including restraints for proper conservation; and, third, to treat resource development as a co-operative undertaking—a partnership in which the participation of private citizens and state and local governments is as necessary as federal participation.

"In other words, I believe the job to be done is so great that the Federal Government should build some projects, local governments some, and private interests some, and that there should be joint effort on still other projects. A number of projects in the Pacific Northwest, as well as in other parts of the nation, are being constructed in accordance with these policies."

"I am more convinced than ever that these policies are sound," the President concluded.

Speaking of the Hells Canyon development of the Idaho Power Company which was a long hoped-for plum of public power, the President said:

"Obviously the nation cannot and should not finance all water resource development with federal funds. The Idaho Power Company will permit the Federal Government to devote more of its financial resources to other developments which are clearly beyond the capabilities of non-federal interests alone."

DON UNDERWOOD

NEIGHBORHOOD BIRDS

The English Sparrow

In Minnesota, the English sparrow is an abundant permanent resident. Dr. Roberts, in *The Birds of Minnesota*, pinpoints June, 1875, as the date of their introduction into the state. The original birds were brought from New York and released in St. Paul. That they survived their first winter in Minnesota and bred successfully is evidenced by the fact that Dr. Roberts could note "a small flock in Minneapolis in October, 1876," and observed that they nested "about the cornices and under eaves of business blocks." It was first brought to North America through the efforts of the directors of the Brooklyn Institute in Brooklyn, New York, in the fall of 1850. Eight pairs of the English sparrow were kept in captivity during the winter and released in the spring of 1851. Evidently fearful that their first attempt was inadequate, these early sparrow enthusiasts released a second and larger flock in 1852. Records indicate that adjustment to the new environment was hard on the birds in spite of the care that was provided for them.

In the hope that the English sparrow would help in the control of the cankerworm and probably with some admixture of sentimentality, various groups made numerous importations into the New England states between 1854 and 1867. Between 1860 and 1866 several hundred pairs of birds were released in New York city parks; Galveston, Texas, saw a colony established in 1867; Philadelphia provided food and nesting boxes for a thousand English sparrows about 1869; Montreal and Otta-

Sister St. Mark is Associate Professor of Biology, The College of St. Catherine, St. Paul, Minnesota.

wa in Canada welcomed them in 1870; San Francisco added them to the avifauna of the West Coast in 1871-72; Utah put them on their bird list in 1873 or 1874; the first birds were brought to Jackson, Michigan, between 1874 and 1876; Iowa and Missouri imported several pairs as late as 1881 and 1883. Some of these later importations came from colonies already established in this country and others came directly from Europe. In all, it is known that the English sparrow was deliberately introduced into thirty-three of the states and Canada in about 100 different cities. Despite its name, the English sparrow is native, not merely to England, but to all of northern Europe and Asia. Moreover, it is technically not a sparrow but a weaver finch.

The status of the English sparrows by 1887 can be evaluated by the fact that in that year Michigan enacted a bounty law of one cent apiece in lots of twenty-five. Subsequently, the bounty was increased to two cents and birds could be presented in lots of ten. Bounty laws have been adopted in other states but seem to be ineffective and most of them have eventually been repealed. In 1912, Dr. Frank M. Chapman, Curator of Ornithology in the American Museum of Natural History, could write: "Its (the English sparrow's) harsh, insistent, incessant chirp is now the dominant bird voice about our homes, where we may never again hope to hear a chorus of native bird music unmarred by the discordant chatter of this alien." Though not everyone may react thus to its chirping, the fact remains that the English sparrow is with us in far greater numbers than most of us can appreciate.

Falling short of the insectivorous habits that were expected of it (it is 96 per cent a vegetarian) and usurping the niche of some of our very desirable native birds, the English sparrow with its pugnacious, quarrelsome ways has done little to endear itself to the land of its adoption. Its messy habits both in perching and in nesting have made it an unqualified nuisance. If we add to this its unsavory reputation for carrying diseases of poultry and other farm animals, the black marks against the English sparrow more than justify its place among the outlawed birds.

Mindful that "there is so much good in the worst of us and so much bad in the best of us," the writer cannot but reserve a soft spot for the saucy, pert little fellow and while plotting methods to outwit him yet finds delight in watching his

ardent wooing and industrious gleaning of weed seeds in the lawns and gardens.

SISTER ST. MARK WIRTZ, M.S.

THE PATIENT WITH ACUTE MYOCARDIAL INFARCTION

Rehabilitation

When the diagnosis of acute myocardial infarction is confirmed and the medical and nursing measures necessary for supporting the injured heart have been accomplished, the third phase of medical management becomes the responsibility of the attending physician. This phase might be labeled simply rehabilitation if we accept the implied inclusion of such items as medical observation during convalescence, management of residual coronary or myocardial insufficiency, guidance with respect to future occupational and recreational activity, and assisting the patient in his development of a sensible philosophical acceptance of his illness and its consequence.

Rehabilitation has its first application during the emergency care when the attending physician and his nursing staff may prevent severe and persistent psychic trauma by maintaining an optimistic attitude and avoiding whispered discussion among themselves and the patient's family. Early in the course of the illness, while the patient's apprehension is controlled with appropriate sedatives, is an acceptable time to acquaint the patient with the type of underlying disease which caused his attack. A frank discussion at that time will result in better understanding and co-operation with respect to treatment. The period of hospitalization should not be unduly prolonged in the absence of continued evidence for persisting severe coronary insufficiency or myocardial failure. The majority of patients will be relatively asymptomatic and objectively will have the usual continued resolution of electrocardiographic findings and a fall in erythrocyte sedimentation rate in two to three weeks. Then gradual ambulation should be permitted rather than insistence on a set time schedule of rest in bed based solely on a routine recorded in a textbook.

During hospitalization and later in the convalescent period, the physician's ear must be readily available to the patient and questions should be answered frankly and without evasion. Questions during this time help the patient to organize his post-infarction life. On leaving the sheltered existence of the hospital, the usual patient becomes

much aware of his chest and is upset by mild and vague sensations which he previously would have, and did, totally ignore. Patient willingness to listen and reassure with respect to meaningless discomfort as well as to detect evidence for recurrent coronary insufficiency is the physician's responsibility during the convalescent period.

Despite the fact that insurance benefits may well reduce the need for rapid rehabilitation, progressive increase in physical activity after ambulation is permitted and must be encouraged. Physical activity within the limits of the patient's cardiac reserve will do much to abort post-infarction weakness and painful shoulder disease. Theoretically, it may be a factor also in the encouragement of improved intercoronary collateral connections. During his two or three months of post-infarction convalescence, details such as continued removal of obese tissue by diet, postcibal rest periods, and sedative control of anxiety reactions must not be omitted. Specific prescriptions must continue to be individualized. Reduction of the dietary ingestion of fat is justifiable for all patients who have had myocardial infarction. For those with residual angina pectoris, a trial of a long-acting coronary vasodilating drug for a period is indicated as well as the prescription of nitroglycerin. Congestive heart failure must have appropriate dietary, cardiotonic and diuretic management. The continued utilization of anticoagulant drugs is especially indicated for those who have had repeated infarctions of the heart or have continued severe angina, or known thrombosing tendency.

In this third phase of management, the physician should conduct himself in such a manner that his patient is encouraged to resume a productive life within the limits of his tolerance and that his patient is satisfied and sure of himself at that level of activity.

MILTON W. ANDERSON, M.D.

THE TRAVEL AGENT

The doctor is using the services of the travel agent more and more these days for his tickets to conventions and his vacation trips. The convenience of the travel service is great and saves much time, as the doctor can just telephone his agent, give him his requirements, and the tickets are delivered to his office.

A travel agent is a professional person although there is no real formal training to become one. The

American Society of Travel Agents has a training school, but for personnel who are already associated with a travel bureau, and the same is true of the classes offered by the airlines to travel agents.

The history of how travel bureaus came into being is an interesting one. An Englishman by the name of Thomas Cook started, away back in 1841, taking Sunday school groups to visit the large towns in England and then a few years later he organized groups to travel from England to the Continent. These trips became so popular that Thomas Cook established offices in various cities around the world.

American Express Company, started as Wells Fargo Company, became an express company in 1850. The Wells Fargo name is still used in Mexico City. The American Express Company branched out from an express company to a travel company and is now mostly owned by the Chase National Bank of New York. They have hundreds of offices in Europe, the United States, and the rest of the world.

Brownell Tours of Birmingham, Alabama, was started by Dr. W. A. Brownell July 4, 1887, with a group of ten for a tour of Europe, and they have been operators of escorted tours ever since.

As transportation developed, there was a decided need for more travel bureaus than these big companies. The steamship companies could not have offices in every large city, nor could the companies mentioned above. They needed local representatives, and at first the railroad agents or insurance companies represented them. But, these companies could not devote much of their time to give the service the travelers demanded, so the expert traveler began opening his own office in his home town, offering complete service and information.

At first, any person who wished to start a travel bureau could do so, but now a travel agent has to qualify. He has to be briefed and accepted by the Steamship Conferences, by the Railroad Travel Associations, and by the Air Travel Conferences. He also must first establish an office, and when he is accepted by the conferences, he pays a yearly fee. Then, to represent all the different carriers, he, in turn, must be accepted by each carrier and sign a contract with each carrier.

It is a difficult profession with many rules and regulations. To be successful as a travel agent, one must have knowledge of all transportation, all schedules and information about the places to

visit. Also, travel agents handle bookings in connection with bringing emigrants to this country and assist in making out the necessary affidavits, which are sent by their relatives here in this country.

Sometimes, a travel agent has to assume the responsibility of prescribing the right trip for health reasons for a client, so it is important to know the places well, also to know one's clients.

A traveler can find the travel agent most helpful. He can purchase his complete trip in one office. It is not necessary to go to one office for a rail ticket, another for a plane ticket, and still another for steamship transportation. A travel agent also represents most of the hotels throughout the world, and can make reservations at any hotel desired.

A traveler, if he is going to Europe, does have to obtain his own passport, but the requirements necessary to secure the passport are given to him by his travel agent.

Now, none of these services cost the traveler any additional amount, for the agent represents the companies and receives his commission from the carriers and hotels. The travel agent can save you time and money—and assemble the whole trip for you!

MARGUERITE DAVIS
Travel Agent

THE ROLE OF THE DOCTOR'S WIFE "Protect Your Handsome Investment"

Most doctors' wives remember the careful budgeting to pay off the bills of Medical School. Some are in the throes of doing it while bringing up their families, so they know the money values involved. Those of us who have outlived that phase believe that we have a terrific investment in the labors that cannot be evaluated in terms of dollars on top of the original expense. We all want to know how we can make our husbands take as good care of themselves as they do of their patients. When we see older physicians making such definite contributions to their families and their communities, how can we make sure that our younger men will be given the full measure of their time to make a similar contribution?

Should we urge our husbands to take as many vacations as their purses, consciences and partners allow? How else can we give our husbands the needed relaxation after the hectic demanding

days, when it is often difficult to keep them informed of what we have been doing and thinking.

I see no panacea or definite solution for our problem as long as there are ill people and our husbands are available. But there are many ways in which we can relieve tensions at home and encourage interests in various hobbies, though the fact remains that each day brings new crises in the medical legislation field. We can keep informed about these new pressures and I believe that that is where we as doctors' wives have a definite job to do. It will take much persuasion and study to equip ourselves to understand the forces which are undermining our whole economy and will change our whole way of life.

Perhaps we should go back and study the history of our country, the struggles of the early colonists, and how they accomplished more when they had freedom of activity, based on vitality and opportunity. Are we losing sight of the ideals that made America great? Freedom? Individual initiative? Are our schools teaching the fundamentals and enough science so that our medical schools will continue to have qualified applicants? What ideologies? These are only a few of the things we should be aware of in our communities.

Doctors and their wives hesitate to get into politics, but the time is here when we can no longer remain on the sidelines and not take issue against some of the forces. We must keep informed, as good citizens, and not fear to let our friends and neighbors know how we stand on some of the socialistic legislation that is being promoted at this time. We can all do a wonderful selling job for medicine if we can make the public realize that first-rate medical care cannot survive rules, regulations, controls and assembly line technique.

Our first job, therefore, is to be informed. We have a very able legislative chairman in the Medical Auxiliary who will alert members to any action on the state and national level. Our husbands receive notification from the Medical Society, too, but they do not always have the time to peruse all the mail they receive, so it is up to us to call it to their attention. We may be asked to write to our congressmen; this is important. We may even write our husbands' letters, but get it done.

This is a wonderful field of joint endeavor, for any legislation that affects our husbands also influences our lives. The time is long past when the practice of medicine can be carried on as it once was, and whether we like it or not, public health

EDITORIALS

is a political football which some forces would like to have under government control. Unless we do our share in trying to stem the tide, we have no one to blame but ourselves.

To protect our handsome investment, we must be informed, practice good public relations, and at home avoid burdening him with unnecessary family problems, try to find some form of relaxation for him, with or without the family as he desires, and stand up and be counted at election time or whenever we are alerted to action.

(MRS. C. L.) HELEN OPPEGAARD
*Immediate Past President
Woman's Auxiliary, MSMA*

The title for this editorial is taken from the *New Jersey Medical Auxiliary Journal*.

GROOMING PHYSICIANS FOR THE FUTURE

November first is an important date for members of the Minnesota State Medical Association. This date will mark the deadline for the acceptance of 1959 applications for the rural medical scholarship. Physicians of the state have the important task of perpetuating the profession in a growing state. Particularly important is the matter of providing physicians to rural Minnesota communities.

In 1951, the rural medical scholarship was established by the Minnesota State Medical Association for that purpose. Since that time six recipients have been awarded the scholarship.

The scholarship provides one thousand dollars each year for four years on the condition that the recipient agrees to practice medicine in a rural Minnesota community for at least five years after graduation from the University of Minnesota Medical School.

Members of the Minnesota State Medical Association are encouraged to make every effort to counsel young persons interested in medicine or related fields. Scholarships may create an awareness, but the encouragement of a dedicated man of medicine is more likely to be the determining factor which impels action.

Physician, is there a medical school freshman of your acquaintance eligible for the Rural Medical Scholarship? Encourage him to apply. Perhaps you may be giving the necessary spark to a Minnesota physician, vintage 1963.

PRINCIPLES CONCERNING PARAMEDICAL WORKERS IN RELATION TO MEDICINE

I

Medicine must re-establish its primacy, its overall responsibility and authority, in the realm of medical care.

II

Medicine should undertake to define the conditions under which any paramedical groups may or should be licensed. (Does the public interest require their licensure, or would licensure only lead to independent functioning which is not in the public interest?)

III

In the interest of a better co-ordinated professional service, medicine should determine and define the need for each paramedical group, its functions, its educational standards, and the manner in which its members (whether licensed or unlicensed) are to be recognized and supervised.

IV

Medicine should assert the principle that every physician has the legal right to do anything for the patient that his medical care requires, and that he further has the right to delegate to any paramedical worker any technical procedure.

V

Medicine should further assert the principle that whatever privileges may at any time be granted to limited practitioners or paramedical workers, whether by law or otherwise, such grant in no way circumscribes the physician's authority in that field and in no way restricts the practice of medicine by the physician.

VI

The medical profession as a whole should recognize the basic fact that whenever any paramedical group succeeds in establishing independent status in any area of professional medical practice, or in circumscribing or compromising the authority of the physician in any area of professional medical practice, the threat or the damage extends to all of medicine and should be of concern to the entire medical profession.

These principles were adopted as an official statement of the National Medical Foundation for Eye Care by its Board of Trustees, May 27, 1958. Additional copies are available from the Foundation at 250 West 57th Street, New York 19, N. Y.

President's Letter

OSTEOPATHY

Doctor: Would the health and welfare of the people of Minnesota be jeopardized if full rights of practice were granted the osteopaths?

How would you answer that?

At the onset, it should be emphasized that the osteopathic concept was indefinite at the start and recent investigations have shown that it still is. For evidence, note the statement which appears in an officially sponsored booklet, published in 1957 and called "The Osteopathic Profession and its Colleges." According to this statement,

"The human body is self healing, its adequate functioning depends on its unimpaired structure, and an uninterrupted nerve and blood supply to tissues is indispensable to the normal functioning of all parts of the body."

The first school of osteopathy was chartered in 1892 and was given the privilege of granting an M.D. degree, but chose instead to grant the degree of D.O. By the turn of the century, there were a great number of schools of osteopathy, most of which were short lived. At the present time, there are six schools left: Philadelphia, Chicago, Des Moines, Kirksville (Missouri), Kansas City, and Los Angeles.

If one studies osteopathic literature, one finds that the "osteopathic concept" has not even yet been well defined. However, what definition there is is still approximately that of its founder, Albert Taylor Still, in 1874. There has been no advance, therefore, in osteopathy as such. All the advances which have been made, and about which we—and the legislature—have heard have been advances in medicine which have been adopted by the osteopathic schools and the individual osteopaths. This may be more precisely indicated by a study of the osteopathic literature. The *Journal of the American Osteopathic Association* is patterned after the *Journal of the American Medical Association*; the articles contained in the *Journal of the American Osteopathic Association* occasionally are osteopathic in content; that is, they have to do with skeletal and muscular strains, but even then they usually use medical texts as references. Most, however, are medical articles which are primarily review articles and use an almost exclusively medical bibliography. So, as stated before, there have been no advances in osteopathy, only advances in medicine adopted by osteopaths.

Now, if we should grant that medicine rather than osteopathy is taught in osteopathic schools, where are we then? One solution would be to convert osteopathic schools to medical schools. If the first school had chosen to grant the M.D. instead of the D.O. degree, this effort of osteopaths to practice medicine would have been solved long ago. Their schools would have been upgraded to Class A medical schools as the homeopathic schools were, and their graduates would have been practicing medicine. The advertising value of the D.O., however, interferes with such a process now.

Under present conditions, the welfare of the people of Minnesota does not allow the practice of medicine under two names. The older osteopaths are practicing manipulation. Almost no pharmacology was taught in their schools as late as 1935. The younger osteopaths are coming closer to medicine. However, it is obvious that medicine under two different names would lead to deterioration because of differences in standards and in regulatory agencies. Also, if medicine is practiced by one group other than medical men, what is to prevent other groups with other restricted backgrounds from claiming practice rights? And what then will happen to standards and regulations?

For these reasons, and others, the Minnesota State Medical Association is opposed to granting full medical and surgical practice rights to osteopaths.

Horatio R. Sweetser

President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

MINNESOTA HEALTH POLICIES HIT NEW HIGH

The number of Minnesotans covered by voluntary health insurance has reached a new high according to Health Insurance Institute reports.

A special survey has revealed that 78.3 per cent of the projected state population now have some form of insurance, as compared with 72 per cent of the nation's civilian population.

The survey, based on reports of insurance company programs and other health care plans listed these figures for Minnesota to support the announcement:

Hospital expense insurance—2,621,000 persons covered at the end of 1956 as compared with 2,468,000 at the end of 1957.

Surgical expense insurance—2,372,000 as compared with 2,232,000.

Medical expense insurance—1,620,000 as compared with 1,553,000.

GOVERNMENT PARTICIPATION IN MEDICINE ENLARGED BY CONGRESS

The second session of the 85th Congress adjourned on a weary note during the early hours of August 24, 1958.

A large number of health measures received congressional consideration during the two year session. Some were enacted, others will again be introduced in the 86th Congress which will convene January 7, 1959. Impact of legislation enacted in this session of congress will be felt by the entire medical profession.

During its second session, the 85th Congress:

Called upon President Eisenhower to summon a White House Conference on Aging in January, 1961, one effect of which will be to give the specialty of geriatrics another boost.

Directed U. S. Public Health Service to spend the unprecedented sum of \$294.3 million on medical research, a large part of which will reduce operating losses of medical schools and thereby postpone the day when some of them may be closed by funds shortages.

Challenged the "right" of free choice of doctor and hospital, when the subjects are servicemen's dependents having their bills paid in whole or

part by Medicare, and thus strengthened the position of labor- and consumer-sponsored plans which are continually fighting the same battle with organized medicine.

Took a good look at the question of medical care and hospitalization of veterans for non-service-connected conditions and left the impression that legislation to bring about an equitable solution will be introduced and pushed in the 86th Congress.

Turned down the Forand bill, which organized medicine resisted fiercely, but the way was left open for its reconsideration in 1959. Likewise it refused to enact the Keogh-Jenkins bill, notwithstanding skillful efforts of American Thrift Assembly and its affiliated professions, but the outlook for next year is bright.

Authorized three more years of Hill-Burton aid, totaling \$630 million, for hospital construction.

Also three more years of medical research facilities construction, at \$30 million a year.

FIVE VISITS TO THE DOCTOR YEARLY IS NATIONAL AVERAGE

The average citizen sees his doctor about five times during the year, reports the Health Insurance Institute, citing a report issued from the National Health Survey.

Most patients visit the doctor's office. Home calls by the doctor account for less than 10% of the visits.

Some of the early statistics available from the Public Health Survey, which covered the months of July through September, 1957, showed that city residents consult a physician more often than those living on farms or in rural areas. People on farms see a doctor at a rate of 3.6 visits per person per year, as compared with 4.5 for the rural non-farm population. In the cities, the rate of doctor visits per person per year was found to be 5.1.

Not all physicians' calls involve treatment. Survey figures revealed that two-thirds of all doctor visits call for diagnosis and treatment, with the remainder involving preventive care or other such services. While this percentage distribution applies throughout the United States, visits for gen-

eral check-ups are somewhat less frequent among the rural farm population. In August, 1957, 18 per cent of all the people in the country saw a doctor. This is the time of year, the Institute pointed out, when the rendering of medical services is probably at a seasonal low, due to fewer cases of common cold, bronchitis, pneumonia, and other respiratory infections.

The generally held belief that more female than male patients see a doctor was confirmed. National Health Survey data showed that physician visits by female patients amounted to 5.5 per person per year as against 3.9 among male patients. For both sexes, the number of calls increased with age, with the exception of children under five years of age, where frequency of visits was relatively high. Persons at ages five through fourteen had 3.4 visits per person per year, whereas those over age sixty-five averaged 6.8 visits per year.

By type of services, the 4.8 visits by the average person per year is broken down as follows:

Type of Service	Number of Visits
Diagnosis and Treatment.....	3.3
General Check-up.....	0.5
Immunization	0.4
Pre-natal and post-natal care.....	0.2
All other	0.5

INTRODUCING THE AVERAGE FAMILY DOCTOR

The average family doctor today is a well-established physician in his forties who treats about twenty-six patients a day and spends more than eight hours a day on home and office calls.

In its monthly statistical bulletin, Progress in Health Services, the Health Information Foundation released preliminary findings from a survey made in co-operation with the University of Chicago's National Opinion Research Center.

The study was intended primarily to find out what the American public thinks and does about health and health facilities. Interviews were conducted in the summer of 1955 with some 2,400 persons (representing a cross-section of the country's adult population) and with almost 500 physicians named by these persons as their family doctors.

The physicians interviewed are representative of those to whom the U.S. public first turns for medical care or advice. About three-fourths of

the family doctors surveyed by the N.O.R.C. were general practitioners, and almost all of them were in private practice. (By contrast, less than half of the total medical profession classifies itself as general practitioners, and about three-fourths of the profession is in private practice.)

These major survey findings were brought out in the report:

Most of the physicians in the sample were relatively young men. The largest group (over one-third) were in their forties, and doctors under 40 constituted an additional quarter of the total.

The average doctor interviewed spent about six hours a day on office calls and another two hours on house calls. Only one doctor in every fourteen made no house calls, and four out of five physicians were generally available for night and Sunday emergency calls.

About seven out of every eight family doctors were affiliated with one or more hospitals, and more than half of all physicians performed some free work in hospitals.

Commenting on the survey, George Bugbee, Foundation President, further pointed out that four out of five persons interviewed by the N.O.R.C. said they had a family physician to whom they turned regularly when they were sick. Most patients, furthermore, "reported a very good opinion of the abilities of their family physicians, reflecting a confidence that is certainly related to success in patient care."

RURAL FAMILY HEALTH CARE EXPENDITURES INCREASE

The average farm family greatly increased its spending for health care in the fifteen year period from 1941 to 1955.

According to a survey conducted jointly by the U. S. Department of Agriculture and the U. S. Bureau of the Census, the government survey indicated that farm families spent an average of \$15 per person for medical care, while urban families spent \$32 per family member.

In 1955, the individual spending level for farmers was \$63, or nearly 80 per cent of the estimated \$81 laid out by city dwellers.

During this period, farmers not only reduced the difference in health care spending between themselves and urbanites, they also boosted their own medical expenditures on the family level.

The government report states:

"Part of this increase in medical care expenditures is due to the change in price level. But when this is taken into account, a tripling in medical expenditures for members of farm families since 1935-36 and a doubling since 1941 remain."

The report further indicates that the average farm family spent \$60 for medical care in 1941. In 1955, the sum was \$235, which is the equivalent of \$126 in 1941 when the change in price level is taken into account.

The study also disclosed that the average farm family is investing more money in voluntary health insurance to help protect itself against the cost of medical care.

The typical farm family spent \$3 in 1941 for health insurance and \$42 in 1955. This 1955 expenditure was the equivalent of \$13 in terms of what a dollar would buy in 1941, but on this basis still represents an increase of 333%.

In 1955, the report stated, some 51 per cent of farm families had some form of health insurance. In addition, the survey showed that as farm incomes increased, the proportion of families protecting themselves with health insurance tended to rise.

Among farm families with incomes between \$500 and \$1,000 in 1955, some 27 per cent had health insurance, while 42 per cent of families with incomes between \$1,000 and \$1,500 were so protected. The top income bracket, \$7,500 and over, found 69 per cent of the families protected by health insurance.

MEDICINE IS NEWS

The American public has a big appetite for science news—especially medical news. This is one of the findings of a monumental nationwide study, sponsored by the National Association of Science Writers and supported by the grant from the Rockefeller Foundation.

The study is entitled: "The Public Impact of Science in the Mass Media." It was conducted by the Survey Research Center, Institute for Social Research, University of Michigan.

The preface of the 250-page study, just released, points out that "The scientific journals of the world pour forth research papers at the rate of 20,000 a week. The science writer, as the middle man in the flow of communications, must select, condense and translate from this fantastic deluge of information those items he is to transmit to

the lay audiences of the mass media. In economics terms, it is not supply but demand that is the problem in the transaction."

Much of the study, which deals with nine specific objectives, was concerned with medical news and the reading public.

The study revealed, for example:

Medical reading is more prevalent among women than men.

Medical reading increases with age, but there is a sudden drop in the group of sixty-five and over.

The West leads in the percentage who read all news of medicine, and the south and north-east trail.

The science consumer (the reader or TV viewer) retains a lot of what he reads and hears.

Medical stories center around the major diseases.

Information that can be applied to everyday life is largely of the medical type.

Almost one third of the newspaper audience want more science news, and almost one half want more medical news.

The science consumer prefers to receive science and general news via the written media.

Based on newspaper readers, only 41 per cent reported that they read all medicine and health news, 35 per cent said they read some, 13 per cent said they glanced at it, and only 10 per cent said they skipped over it.

LEGAL PROFESSION SURVEY PLANNED BY AMA

A survey among approximately 10,000 attorneys will be conducted this fall by the Law Department of the AMA to determine subjects of mutual interest to physicians and attorneys. Physicians and attorneys will be asked to respond to questions on interprofessional relations, medical professional liability, and expert medical testimony.

The need for such a study is evidenced by the fact that as high as 80 per cent of all cases tried today require medical testimony, and that 7 out of 10 personal injury cases are decided on medical rather than legal considerations. It is incumbent upon the medical profession to be aware of the problems of attorneys and the role of medicine in the judicial system. It is hoped that this information can be used to promote good working relations between physicians and attorneys.

New Code for Doctors and Lawyers

A new "National Interprofessional Code for Physicians and Attorneys" was approved by the AMA's House of Delegates at its Annual Meeting in San Francisco. The Code will serve as a suggested guide for physicians and attorneys in their inter-related practice in the areas covered by its provisions—subject to the principles of medical and legal ethics and the rules of law prescribed for their individual conduct.

The Code was formulated by a joint national medicolegal liaison committee made up of representatives appointed by the American Bar Association and the American Medical Assn. The three medical representatives include Doctors David B. Allman, Hugh Hussey and George Fister. Besides drawing up this new Code, the joint committee has considered such things as the encouragement of state and local medicolegal meetings, medical professional liability problems, medicolegal forms and the possibility of establishing medicolegal courses in law schools and medical schools.

The Code has been prepared in general terms to permit its adaptation in light of local conditions.

AMA PLANS GROUP PRACTICE ROSTER

The AMA's Council on Medical Service has been in the process of compiling information on group practices throughout the country and eventually plans to publish a directory of these groups. To date the Council has information on 989 such groups located in the United States, Hawaii and Canada. Verification sheets have been sent out to those groups already on file. Physicians who practice in groups of two or more—who have not received a check sheet—are invited to send the following information to the Council: group practice name, address, office building (indicate whether rented or owned), number of physicians, and the specialties represented.

CHAMPIONS OF MEDICAL LEGISLATION RETIRE

Two congressional proponents of health legislation are retiring after more than thirty years of laudable service. They are Representative Charles A. Wolverton (R., N.J.) and Representative Thomas Jenkins (R., Ohio).

Representative Wolverton, former member of

the House Commerce Committee, was recently known for his chairmanship of hearings in 1953 into major disease problems. He will retire a veteran of thirty-two years of congressional activity.

Congressman Jenkins, known for his role in the sponsorship of the Jenkins-Keogh bill, will retire for reasons of health after thirty-four years of continuous service in Congress.

To these honored gentlemen, the Minnesota State Medical Association extends a sincere thank you and well wishes upon their retirement.

CENTRAL REPOSITORY FOR MEDICAL CREDENTIALS

A Central Repository for Medical Credentials is now available to doctors of the world. The American Medical Association has brought to the attention of its members such a program initiated by the World Health Association, July 1, 1958.

According to the American Medical Association, the project is worthy of consideration because frequently during war and national uprisings, medical records are often lost or destroyed. Because of this, many doctors are today unable to utilize their professional skills because of the loss or destruction of their original credentials and a lack of a protective service in which authenticated copies could be deposited. Therefore, the World Medical Association has undertaken a program to assure that the doctor will always be able to prove himself medically trained and fully accredited to practice medicine.

In the United States, the lifetime cost of the service on a one-payment basis to the newly graduated doctor is approximately \$60.00. An actuarial schedule has been established for doctors in the various age groups. A ten-year service rate is also available.

Repository officials suggest that the credentials deposited include official medical school record, medical diploma, and specialist credentials. American doctors should *not* send their original credentials, but should send photostatic, microfilm, or notarized copies of their original credentials.

Requests for forms and additional information in regard to the Central Repository for Medical Credentials is available from the World Medical Association, 10 Columbus Circle, New York 19, New York.

History of Medicine in Minnesota

A MEDICAL HISTORY OF MEEKER COUNTY PRIOR TO 1900

HAROLD E. WILMOT, M.D.

Litchfield, Minnesota

(Continued from the July issue)

Dr. Kennedy evidently was married in Chicago in 1849 while in Rush Medical College. Miss Julia A. Rudisell was his first wife and bore him two children; one, Julia A., married Nimrod Barrick, and they lived on the original claim in Meeker county throughout their lives. Under this name several grandchildren and great-grandchildren are still actively contributing their share to Meeker county's economy.

The first Mrs. Kennedy died July 13, 1854. Her sister, Caroline, who had been housekeeper for the doctor at and after that time, and Dr. Kennedy were married July 2, 1860. Three sons were born to this union—Milford P., who farmed in Dakota, and Harry M. and Lewis H. who attended the University of Minnesota.

Dr. Kennedy died February 7, 1903, from Bright's disease and was buried with honors of the G.A.R. in Ripley cemetery. He was seventy-eight years, six months, and twenty-seven days of age.

This man had boundless energy, determination, and foresight as will be shown by a few quotations from local newspapers during the span of his greatest activity.

News Ledger, April 3, 1873—"We learn that Dr. Kennedy's team took a sudden bath in Cedar Lake a few days ago in which they remained for over an hour before they could be extricated."

Litchfield Ledger, October 23, 1873—"Dr. V. P. Kennedy was Secretary of the Meeker County Democratic Convention of 1873."

Litchfield Ledger, December 25, 1873—"A Cedar Mills news item bemoans the removal of Dr. Kennedy to Litchfield."

News Ledger, February 19, 1874—"Dr. V. P. Kennedy was elected President of the Meeker County Council Patrons of Husbandry (National organization with townships organized under a county council)."

News Ledger, October 15, 1874—"Dr. Kennedy left for the east on Monday last. His family have moved to Cedar Mills for the winter."

News Ledger, December 10, 1874—"Dr. Kennedy will go to Philadelphia after the holidays and attend medical lectures."

News Ledger, February 11, 1875—"Dr. Kennedy was registered at the Minnesota Headquarters, New York, a few days ago."

News Ledger, October 28, 1875—"People are advised not to vote for Dr. Kennedy for state Representative as he could not be spared from his legitimate business."

News Ledger, February 14, 1877—"A leg amputation was successfully done a week ago in Wright county by Dr. Kennedy."

News Ledger, July 25, 1878—"Dr. Kennedy became a "Greenback" candidate (Democratic—?) for State Senator. There was considerable criticism in this by the *Republican News Ledger* until election time, October 5th, of that year. Dr. Kennedy was defeated by the incumbent Charles E. Cutts of Forest City by only 33 votes. A recount was considered by both men but 'as gentlemen, both abandoned the idea.'"

HISTORY OF MEDICINE IN MINNESOTA

Independent Review, September 4, 1880—"Dr. Kennedy resigned as committee member of the Republican county organization due to differences with the party, and it was accepted."

News Ledger, September 16, 1880—"After much vituperative discussion between Dr. Kennedy and Si Leavitt regarding hiring a school teacher, one letter published for Mr. Leavitt concludes as follows: 'You have the reputation of being a surgeon. Turn your professional knife upon yourself, to cut from your heart the rooted cancer of falsehood and treachery that has flourished there until it has outgrown and overtopped every honest principle of your being; your scalpel to scrape from your brain the corrosive barnacles of buffoonery, bombast and slander, so long the leading principles of your life, and it is barely possible you may then be received into the society of respectable people.' Laconia, New Hampshire, September 16, 1880. S. W. Leavitt."

News Ledger, September 23, 1880 (portions of Dr. Kennedy's reply)—
"An Adieu to Si Leavitt"

"Editor, *Ledger*: In your last issue appeared a communication all the way from New Hampshire characteristic of the man who penned it. For scurrility and low billingsgate he even outdid himself.

[Dr. Kennedy proves by letters from President Folwell and Dr. Hutchinson of the University of Minnesota that he was right in his argument.]

"'Falous in Uno, Falous in Omnibus' if applied to Si Leavitt, would make him unworthy of belief in anything. . . . And it only remains now for him to make the same assertions in reference to President Folwell and Dr. Hutchinson and everybody else. I suppose that he would expect this community to believe it. Adieu, my little man in black, adieu. V. P. Kennedy.'"

Dr. Kennedy at this time was again running for State Senator against W. M. Campbell. The results were close and contested, but settled in the Minnesota Senate chambers February 15, 1881, that Campbell had won by sixteen votes.

News Ledger, April 1, 1880—"Dr. Kennedy is the president of the newly organized Litchfield Board of Trade."

About this time, Dr. S. L. Barr, who had a somewhat loose association with Dr. Kennedy left him to later establish himself at Glencoe, and we find this courtesy card in the *News Ledger* of November 24, 1881:

"Drs. Kennedy and Newlands
Physicians and Surgeons
Office: Dr. Kennedy's Old One—Marshall Ave.
V. P. Kennedy, M.D. George Newlands, M.D.
Night Calls at Office Promptly Attended To."

News Ledger, April 21, 1881—"Last Sunday Dr. Kennedy was thrown from his buggy and his shoulder was dislocated. Dr. Bissel was called and set same. Dr. Kennedy is again out now but suffers considerably from the accident."

News Ledger, February 23, 1882—"Dr. Kennedy is home again. He has been to Washington within the past month and had a squint at the assassin Guiteau."

Independent, December 2, 1884—"Dr. Kennedy arrived here for a short stay last Saturday. He was elected to the Dakota Council (Territorial) at the late election. His district comprises ten counties, and he managed to squeeze in with a majority of 7000 votes."

Independent, January 20, 1885—"Dr. Kennedy is in his element now. The Dakota Legislature is in session, and the Dr. has created a furor by announcing that he will introduce a bill for relocating the capitol.

"South Dakota has a clear majority in the Legislature and there will no doubt be some lively music over the matter."

Independent, April 28, 1885—"Dr. Kennedy subscribed \$20.00 toward the G.A.R. hall. He is living in South Dakota, but has not lost all interest in Litchfield."

Independent, December 1, 1885—"Dr. Kennedy has been in town for a few days. He will start soon for Florida with his family to spend the winter."

Independent, May 28, 1886—"Dr. V. P. Kennedy and wife arrived in the city early last week and have moved into their residence east of the park. The doctor says he has come back to stay. Look out for a lively time in politics this fall."

HISTORY OF MEDICINE IN MINNESOTA

Independent, July 13, 1886—"The crops on Dr. Kennedy's farm in Dakota was destroyed by hail last week but covered by insurance."

Independent, October 5, 1886—"Dr. Kennedy nominated in Republican convention for Meeker County, as candidate for State Senator. Defeated by O. H. Campbell. He was made chairman of the Republican county committee, however, for the ensuing year. Charles E. Cutts was a member of the same committee."

In April, 1889, we find him going to Amarillo, Texas, investing in land and returning to Litchfield in June. He returned to Amarillo in October, ostensibly to check on crops.

A note at about this time appeared in a column in an Idaho (sic Dakota—?) paper: "Brother V. P. Kennedy has been a member of the I.O.O.F. forty-four years, treasurer of same the twentieth time, city treasurer a number of years. He has been a pharmacist. Had his reverses at times, but had tended to business and his word is good as law."

News Ledger, March 29, 1887—"He refused to be a nominee for mayor."

Apparently from this time on he devoted little time to public service but was kept busy with his many outside interests and certainly appeared happy and contented in his late years.

Dr. Kennedy was a great Latin and Greek scholar and coached students, hence his long and verbose newspaper battle with Si Leavitt over the qualifications of a high school teacher. He could do anything with his hands and in his old age in Aberdeen, South Dakota, built a duplex doing most of the work himself. He was one of the most outstanding pioneers in the vicinity.

Dr. Russel Whiteman.—According to Dr. Rosenthal, Dr. Whiteman was born in Essex, New York, and died in Anoka, Minnesota, February 26, 1893. He graduated from the Union College, Philadelphia, in 1844 and came to Minnesota in 1857 (?) and settled on a farm in Meeker County. He moved to Anoka in 1864 where he practiced medicine.

He is listed by A. C. Smith as being one of the three first white settlers in Greenleaf township, one of the others being Dr. V. P. Kennedy, and they arrived in 1856. A son was born to him in 1857 and may have been the first male birth in Meeker county, a girl by name of Dougherty having been born in Meeker county in 1856 at or near Forest City.

Dr. George Weisel came to Meeker county probably in 1866, locating at Forest City. He was an allopath, and when the county seat moved to Litchfield in 1869 he also moved there. He helped develop a subdivision, and a street was named in his honor. He was the first practicing physician to settle in Litchfield.

He was married to Isabella E. Grenier apparently about the same year he came to Litchfield (1870).

He was a charter member of the Masonic Lodge organized in Forest City, Meeker county, May 18, 1867, and was a member of the Presbyterian faith.

He was listed as president of the Litchfield village council in 1873.

His last courtesy card was published in the *News Ledger* December 25, 1873. At that time a news item stated he was in Atlanta, Georgia, for the winter.

On June 11, 1874, he was stated to be practicing in Wisconsin.

News Ledger, August 10, 1876—(news item) "An infant child of Dr. G. W. and I. E. Weisel died of dysentery on Sunday, July 23rd, and was buried in Valley City, North Dakota, on the following Monday. She was a lovely babe of nineteen months. The doctor and his

HISTORY OF MEDICINE IN MINNESOTA

estimable wife have the sympathies of all who know them. Dr.'s native home is Williamsport, Pennsylvania."

No further information seems available. Apparently he moved to Valley City, North Dakota.

Dr. Ernest Hildebrandt.—Within a few years of the time Dr. Kennedy returned from the Civil War, we find Dr. Ernest (or Ernst) Hildebrandt settling in Forest City in 1869.

Dr. Hildebrandt was a large strong man, blue-eyed, brown haired, well dressed, six feet tall and weighing about 200 pounds, and wearing a goatee beard. He was possessed of a strong German accent and stated that he had been "once or twice in the army" and was "familiar with gunshot wounds." He drove a single horse and buggy chiefly in making his calls and was liked and respected by all who knew him.

He was born in Germany, November 5, 1829. He had been educated in Germany at the University of Jena, 1849, and had practiced in Erfurt, Germany, previous to 1868. He came overseas in a sailing ship in that year and located in Watertown, Minnesota, remaining there until about 1870. He arrived in Forest City, Meeker county, according to his own statement in 1869. He was listed in the Minnesota Medical Directory of 1890 in Forest City and legally authorized to practice under the "Years of Practice Act." The transactions of the Minnesota Medical Society reveal him "Licensed by Exemption" No. 845, March 27, 1884, with his address listed as Forest City.

He was described by one of the early settlers of that community as a "pill doctor"; he probably did not conduct as many surgical procedures as some of his competitors. He had his office in the home and a library of his own. He was friendly and kindly, a member of the Lutheran church, and interested in reading and music. His military record is unobtainable, but it is reasonable to assume that it took place in Germany with none in the United States forces.

He was married to Emily Louise Conrad who was born in Germany, February 24, 1830. The marriage date is not known. Eight children were born of this union, and it would seem all arrived before his coming to Forest City. They are: Odelia (Mrs. Jake Burfenning), who had two children, Forest City, Minnesota; Minnie (Mrs. P. Schafer), five children, St. Paul, Minnesota; Anna (Mrs. Henry Lawson), two children, St. Paul, Minnesota; Lena (Mrs. Henry Lenbard), Darwin, Minnesota; Mary (Mrs. C. J. Johnson), one child Louisa (Edwards), Watkins, Minnesota; William, a miller, Forest City, Minnesota, three girls; Robert, a mechanic, two boys and one girl, St. Paul, Minnesota; Max, a mechanic, three boys and one girl, Minneapolis, Minnesota.

All of his children are dead, but many grandchildren and great-grandchildren are living. A grand nephew, Walter, has been a student at the University of Minnesota School of Medicine.

Mrs. Hildebrandt died April 4, 1898, and was buried in Forest City, Meeker county, cemetery. Dr. Hildebrandt died in Forest City on March 17, 1913, of cerebral hemorrhage, and is buried at Forest City.

He and his brother conducted a grist and flour mill at Kingston for some time on their early arrival, but evidently he sold to his brother; though his son later took over a flour mill at Forest City.

His testimony as a medical witness in a murder trial which took place in Forest City in 1873 and whose principals were neighbors was clear and logical, particularly

HISTORY OF MEDICINE IN MINNESOTA

as to entrance and exit of the bullet, and did much to assist the court in meting out justice. The violence resulted from a dispute over land.

The early records show Dr. Hildebrandt's son, William, as county coroner.

The doctor was practicing medicine actively in 1887, 1897, and 1898, as his signature is found on official records in the Meeker county courthouse.

The *Independent* of August 30, 1884, has this to say in a Forest City news column:

"Dr. Hildebrandt has been visiting the Cities the past few days in a professional way. From the teams which we see hitched in front of the doctor's office every day, we should judge that he had a rushing practice."

Independent, January 13, 1885—"Dr. Hildebrandt seems to be on the road much of the time during the severe weather we have been having."

Independent, January 27, 1885—"Dr. Hildebrandt's young folks were down visiting their friends near Darwin last week."

Independent, February 3, 1885—"Dr. Hildebrandt started for the Cities one day this week. He expects to be absent until some time next week."

Independent, October 5, 1886—"William Hildebrandt (son) is a Republican delegate from Forest City to the Meeker County Republican committee."

Word of mouth and history available gives us the over-all picture of a kindly, hard-working physician who gave the pioneers ever-ready services for their needs and left a fine group of progeny to carry on life's duties.

Dr. Frank Elmore Bissell (or Bissel) was a regular physician who located in Litchfield in 1871. He was born in Hartford, Wisconsin, December 27, 1845, being the first male child born in Washington county of that state. His parents were Cyrus and Amanda (Case) Bissel, natives of Connecticut, and came to Washington County, Wisconsin, among the earliest settlers of that region. They were farmers, but the doctor entered a drug store at an early age and remained in the druggist's employ for five years.

When eighteen, he enlisted in the U. S. Navy, served on a U. S. gunboat on the Mississippi River, and was in a number of minor engagements. His work was surgeon's steward. He was mustered out July 9, 1865; the doctor then went to Cleveland, Ohio, and that winter entered the Charity Hospital College, from which he graduated in the spring of 1869. He first began practice in Clinton Junction, Wisconsin, but moved to Litchfield in 1871. In the spring of 1878 he moved to Cold Spring, Minnesota, and was elected to the state legislature from that county (Stearns) the same autumn; and upon finishing his term in the spring, he returned to Litchfield and remained. He had operated a drug store in Cold Spring.

January 19, 1875, Dr. Bissell was married to Miss Addie F. Simons of New York. Two children, Emily S. and Frank S., arrived November, 1875, and October, 1878, respectively. The family were prominent Episcopalians, and the doctor was active in civic affairs, state politics, and the G.A.R. He was elected to the village council in 1880 and as mayor in 1886. He was a member of the Minnesota State Medical Association and president of the pension examining board. He was a charter member and officer of E. Branham post of the G.A.R. and a charter member of Frank Daggett post 35 of the G.A.R., as well as commander for one year. He was a surgeon of this latter post for years; he was medical director of Minnesota Department, G.A.R., two years; he was a member of Golden Fleece Lodge 89 A.F. & A.M. and of Robboni Chapter 37 R.A.M.

Dr. Bissell also served as village health officer for seventeen years and was president of the Crow River Medical Society. He was president of the Meeker County Republican committee in 1880.

HISTORY OF MEDICINE IN MINNESOTA

Mrs. Bissell was also very active in social circles, serving as Worthy Matron of Fidelity O.E.S. and Grand Matron. She also was president of the Department of Minnesota W.R.C.

News items of then current files disclose many angles of interest:

News Ledger, June 4, 1872—"Dr. Bissell's bid to furnish medical attendance on the county poor was accepted and the county auditor was instructed to make a written contract with him at rates mentioned in his bid. Satisfactory bonds to be furnished and the board to reserve the right to annul the contract for incompetency or other proper cause. (The doctor sued for his fee, won, and the case was appealed and denied.)"

News Ledger, December 18, 1873—"Dr. Bissel of this village and Dr. V. P. Kennedy have put their heads together and are now doctoring the sick in partnership. Dr. Kennedy is an old resident of this county and skilled physician, and he and Dr. Bissell will have all the practice they can wish for."

News Ledger, January 19, 1875—"Dr. F. E. Bissell and Miss Addie F. Simons were married at Trinity Episcopal Church, the first public wedding in the new church. The Rev. T. G. Crump officiated."

News Ledger, December 9, 1881—"Dr. Bissell is visiting schools today and tomorrow to give smallpox vaccinations."

News Ledger, January 19, 1881—"Dr. Bissel operated strangulated hernia. Dr. Stuart assisted him."

"Drs. Bissel, Barr, and Newlands operated on a boy for skull fracture in the Litchfield House. He died six hours later."

News Ledger, August 23, 1884—"Drs. Bissel, Chapman, and Laughton held a post mortem examination in the case of Mrs. Asher and found, as Dr. Bissel had previously said, that she died of cancer of the stomach."

Among other news items are some to the effect that he captained one team of a hunting contest in 1883. (His team was defeated.)

Independent, March 4, 1885—"Dr. Bissel and Dr. McCollum of Dassel extracted a cap from a finger which had been present twelve years. In the operation a new anesthetic was used, applied locally."

Independent, June 4, 1889—"Two runaways of Dr. Bissell's team this week. The second time they ran into Lake Ripley."

News Ledger, February 4, 1886—"On his return from Darwin last night, where he had been called to suture an artery in a leg, Dr. Bissel had quite a cold experience. He got a mile or two this side of Darwin when, in the blinding snow, the horses wandered from the road, and for over three hours the doctor drove around over the prairie before he was able to find the road. During that time he was tipped out into the snow four times, and one of the times his team very nearly got away from him. With the mercury down among the thirties (below), the wind blowing a gale, and the snow flying in blinding clouds, such an experience would be no pleasant joke for any man. When the doctor finally reached home, he was thoroughly numbed and almost speechless from cold."

Dr. Bissell was entered on the Office Register of Physicians with License No. 565, dated January 26, 1884.

News Ledger, August, 1901—"Dr. Bissell Appointed."

"Dr. Bissell was last Tuesday appointed surgeon by the trustees of the Soldiers' Home in Minnehaha to succeed Dr. O. S. Pine who has held the position for several years. The doctor will assume charge about September 1st and later will be joined by his family. Dr. Bissell is a man of many years experience in the medical line, and he will no doubt fill this important place to the satisfaction of all. He is an old soldier and a member of the post of this place. He is receiving congratulations from all sides."

This is the last news item available.

One of our present older settlers tells me that Dr. Bissel died "some place away." He believes that he was married a second time but states that inasmuch as Dr. Bissel had an invalid brother, O. A. Bissel, living with him, this brother may have married Mrs. Collier, a widow.

HISTORY OF MEDICINE IN MINNESOTA

He further states that the doctor was a large, round faced man, with a handle-bar moustache and dark hair. He was pleasant, a good mixer, and a very conscientious and hard worker. His picture in the local G.A.R. Hall discloses those features.

Dr. J. S. Bell, a homeopath, was one of the early physicians, arriving in Litchfield probably in May or June of 1872. His courtesy card first appeared in the *News Ledger* of that year on July 11, and reads as follows: "Dr. J. S. Bell—Surgeon and Homeopathic Physician."

News Ledger, July 11, 1872—"Excursion train wreck at Howard Lake coming from Minneapolis June 10, 1872. Dr. Bell of this village was one of those who escaped unhurt and he set himself at work immediately to aid those who were injured."

News Ledger, July 2, 1872—"Col. Hancock in behalf of the St. Paul and Pacific Railroad settled the doctor's bills occasioned by the late accident."

I have no further direct information, but, thanks to Dr. Rosenthal of St. Paul and Mrs. Guthrey of Rochester, we learn that Dr. Bell came to Rochester in September of 1871. Mrs. Guthrey quotes the history of Homeopathy of 1880. "Dr. J. S. Bell went to Rochester in 1869; went to Litchfield in 1873." Mrs. Guthrey points out that this is incorrect. She also quotes the *Rochester Post*, December 27, 1873, as to his departure from Litchfield. The item states that "Dr. J. S. Bell, formerly of Rochester, more recently of Litchfield, was in Rochester during the week. The doctor is seeking a more satisfactory and congenial climate."

His last courtesy card appeared in the *Litchfield News Ledger* December 25, 1873.

Dr. Samuel Barr had a courtesy card in the *News Ledger* of October 18, 1876, as previously noted. Apparently, he arrived at about this time and did cooperate with the other physicians to a considerable degree, assisting with operations. He did have letters printed in the newspapers in an independent manner to establish his talents and charges before the public as previously noted.

I will quote a few further items from the newspapers:

News Ledger, June 19, 1879—"Married: Dr. S. L. Barr to Miss Ada Benjamin of Iowa."

News Ledger, February 26, 1880—"The Deaf to Hear."

"If I cannot make the deafest man in Meeker county hear without the use of an ear trumpet, or shouting loud enough to wake the dead, it will be for the reason that the nerve of hearing is dead. Come and try it.

Dr. S. L. Barr—Over Post Office"

News Ledger, April 14, 1881—"Dr. S. L. Barr ordered all children vaccinated."

News Ledger, September 15, 1881—"Samuel L. Barr, M.D., of Philadelphia, Pennsylvania, is now in Litchfield to remain indefinitely. He has made a specialty of women's diseases besides those of eye and ear, and in fact, of every disease the human system is heir to and has been successful in his treatment, as thousands are willing to testify. Office over Brill's drug store."

News Ledger, March 22, 1883—(news item). "Dr. Barr's professional card appeared in the *Minneapolis Tribune* of last week. Glad to see Doc come to the front."

Dr. Barr's last professional card appears in the *News Ledger* of May 31, 1883. He evidently moved to Minneapolis.

Dr. Rosenthal states that there was no professional record in Minnesota Medical Association files of his having been licensed. He may have procured a license elsewhere or may not.

(To be continued in the January issue.)

MINNESOTA BLUE SHIELD-BLUE CROSS

According to the Health Insurance Council's twelfth annual survey, voluntary health care programs furnished Americans and their families more adequate coverage to help pay the costs of hospital and medical care in 1957 than in any previous year. To emphasize this point, the report shows that during 1957, total health care payments increased 16.7 per cent over 1956, as compared to an increase of only 4.7 per cent in the number of people with health care coverage.

At the end of 1957, approximately 121,432,000 Americans had some form of coverage to help pay hospital bills, 108,931,000 persons had coverage to help pay surgical expenses, and 71,813,000 had coverage to help pay regular medical care costs. These figures include persons covered not only by Blue Shield and Blue Cross Plans, but also those covered by insurance companies and independent plans, such as industrial and community plans.

During 1957, the number of persons with regular medical care coverage increased 10.7 per cent over 1956, whereas the number of people with surgical coverage increased 7.5 per cent over the previous year. Percentage-wise, the smallest increase was in the number of people with hospital expense coverage, 4.7 per cent.

Also noted in the survey is the fact that during 1957, a total of 4.2 billion dollars was paid to or on behalf of persons protected under health insurance programs.

Payments to hospitals for care of Blue Cross subscribers nationwide exceeded the 1.2 billion dollar mark during the calendar year of 1957, an increase of 170 million dollars over the preceding year.*

In Minnesota, Blue Cross payments for hospital care incurred by subscribers exceeded 28.6 millions of dollars during 1957, compared to 23.5 millions of care dollars expended during the preceding year.

The first seven months' experience of 1958 indicates further increases in Minnesota Blue Cross dollars expended for hospital care. Over 19.6

millions of dollars have been paid to hospitals during this period for care incurred by Minnesota Blue Cross subscribers. Based upon the resultant average per month for experience, Blue Cross payments for hospital care will approximate \$34,000,000 during 1958.

These overall increases are due to three factors:

1. Minnesota Blue Cross subscribers are continually availing themselves of higher levels of coverage.
2. Increased hospital facilities and cost of living increases result in higher hospital costs per day.
3. Increased usage of Blue Cross benefits by participant subscribers.

Increased usage of Blue Cross benefits by Minnesota participant subscribers has been of continued significance in recent months. During the first seven months of 1958, 513 cases have been paid per year per 1,000 contracts protected, an increase of 5.6 per cent over the similar period of the preceding year.

The frequency of subscribers receiving hospital care because of accidental injuries and poisonings accounts for 28 per cent of this increase in usage. Respiratory illnesses represent 24 per cent and digestive diseases 20 per cent.

SPANISH-AMERICAN WAR VETERANS ADVISED

Physicians and hospital administrators should not assume that Veterans Administration can pay bills for care of Spanish-American War Veterans in non-VA hospitals, the agency has cautioned.

Since few Spanish-American War veterans have disabilities that are service-connected for purposes of hospital treatment, the number eligible for care in non-VA hospitals at VA expense is extremely limited.

A substantial number of veterans of this war have entered private hospitals under the assumption that their care would be at VA expense and later have found they are not eligible for this benefit.

If hospitalization at VA expense is requested, the nearest VA office should be contacted.

*Source E.P.B.R. Research Report 312. —13 and 312.

—17

Summary of Blue Cross Financial Reports

\$1,210,591,526—Year 1957

\$1,040,471,634—Year 1956



In Biliary Distress

ZANCHOL®

Improves Flow and Color of Bile

Zanchol (brand of florantyrone), a distinct chemical entity unrelated to the bile salts, provides the medical profession with a new and potent hydrocholeretic for treating disorders of the biliary tract.

The high degree of therapeutic activity of this new compound and its negligible side reactions yield distinct clinical advantages.

- Zanchol produces a bile low in sediment.
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Bile with these qualities minimizes biliary stasis, reduces sediment and debris in the bile ducts and discourages the ascent of infection.

For these reasons ZANCHOL has shown itself to be a highly valuable agent in chronic cholecystitis, cholangitis and care of patients following cholecystectomy.

Administration: One tablet three or four times a day. Zanchol is supplied in tablets of 250 mg. each. G. D. Searle & Co., Chicago 80, Illinois. Research in the Service of Medicine.

SEARLE

Committee Action

*Hospitals and Medical
Education
Ophthalmology*

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

The following is an abridgement of the report submitted to the Council and to the House of Delegates of the Minnesota State Medical Association at the annual meeting of the Association, May 22 to 24, 1958.

Hospital Construction in Minnesota

The committee noted with pleasure the report of the Minnesota Department of Health indicating that during 1957 four new hospitals in the state were completed while sixteen were under construction, that nineteen hospitals had completed building programs resulting in additional or improved facilities while similar building programs were under way in nineteen others, and that public health centers were under construction in both St. Paul and Minneapolis. Twenty of the programs were accomplished with the assistance of the Hill-Burton program, the remainder without such assistance. Altogether, 2,270 new hospital beds will be provided by these projects when completed, including 2,164 general hospital beds, sixty-two psychiatric hospital beds, and forty-four chronic hospital beds.

Attention should be called to the fact that although Minnesota has received slightly more than \$22 million in Hill-Burton funds since the program started in 1948, the total estimated volume of construction completed, now under way, or in the planing stage, approximates \$300 million in the field of hospitals and related facilities.

Medical Students

In June, 1957, 110 students were and in June, 1958, 113 students will be awarded the Doctor of Medicine degree by the University of Minnesota. The number of students admitted to the Medical School in September, 1957, was 129. In September, 1958, 140 students will be admitted, and 150 will be admitted in September, 1959.

Graduate Medical Training

The State of Minnesota continues to occupy a leading place nationally and internationally in graduate training in medicine, almost all of which is carried out under the Graduate School of the University. During the 1957-58 academic year, 1,003 graduate students were enrolled in the

basic medical sciences and the clinical specialties of medicine. This figure includes 513 graduate students enrolled in the Mayo Foundation program in Rochester and 419 enrolled in the Medical School program in Minneapolis which utilizes for graduate training in the clinical fields, not only the University of Minnesota Hospitals, but also Minneapolis General Hospital, Minneapolis Veterans Administration Hospital, Ancker Hospital in St. Paul, the Gillette State Hospital, and several private hospitals in the Twin Cities. The demand for graduate training in various specialties of medical practice is somewhat less than a few years ago, but the reputations of the University of Minnesota Medical School and the Mayo Foundation attract large numbers of applicants in most areas. Vacancies, however, continue in most of the basic medical sciences as well as in psychiatry, rehabilitation, and anesthesiology.

Continuation Medical Education

The Department of Continuation Medical Education, which presents each year a series of continuation courses for physicians, continues to provide the practicing physicians of Minnesota with an opportunity to review significant fundamental material and to learn of important advances in medical practice. The unique facilities of the Center for Continuation Study provide an atmosphere especially conducive to learning.

During the 1956-57 academic year, 1,246 physicians attended twenty-one courses at the Center for Continuation Study. All but six of these courses were intended primarily for physicians engaged in general practice. During the 1957-58 academic year, 1,414 courses, fourteen of them primarily for general physicians, have been or will be presented. Preliminary figures indicate that attendance during the current academic year will surpass that of last year. Since the fall of 1956, in addition to courses presented at the Center, Regional Seminars for physicians have been presented in Alexandria, Marshall, Fairmont, Detroit Lakes, Olivia-Redwood Falls, and Hibbing by the University in conjunction with the Minnesota State Medical Association and local medical groups.

The Department of Continuation Medical Education also is responsible for the planning and presentation of continuation courses for nurses, medical technologists, and dietitians. These programs continue to be well received.

(Continued on Page A-56)

X-RAYS SHOW HOW ONE PYRIBENZAMINE® LONTAB®

relieves allergy all day or all night

The unretouched X-ray films show how Lontabs release medication in the digestive tract. So that the prolonged erosion of the Lontab core could be visualized by X-ray, subject was given 10 Lontabs, each containing 100 mg. of a radiopaque substance in place of Pyribenzamine.

With its unique formulation, the Pyribenzamine Lontab not only relieves allergy symptoms promptly, but sustains relief as long as 12 hours.



Special outer shell releases 33 mg. Pyribenzamine hydrochloride within 10 minutes.

Unique core releases approximately 18 mg. Pyribenzamine hydrochloride the 1st hour, approximately 50 mg. from the 2nd to the 12th hour.

SUPPLIED: Pyribenzamine Lontabs — full-strength — 100 mg. (light blue).

NOW AVAILABLE: Pyribenzamine Lontabs — half-strength — 50 mg. (light green) — for children over 5 and for adults who require less antiallergic medication.

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2 hours Lontabs are in the stomach and small bowel. Release of core substance is well under way.



4 hours Lontabs are in the ileum and cecum as core has steadily eroded.



8 hours Lontabs are still visible as substance of core continues to be released.



COMMITTEE ACTION

(Continued from Page A-54)

Nursing

The provision of adequate nursing service remains a difficult problem in certain areas of the state, particularly those in which new hospitals have been constructed or existing hospitals expanded. Minnesota, however, is distinctly above the national average in the number of nurses per 100,000 population. A survey showed that 11,586 professional nurses were actively engaged in nursing in Minnesota during 1957. Of these 8,407 were employed in hospitals and similar institutions.

Eight of Minnesota's twenty-nine schools of nursing have four-year degree programs. Although Minnesota ranks nineteenth in population, only seven states have more nursing students. More nurses are graduated by Minnesota schools than by the nursing schools of any of the neighboring states.

Practical nursing training is carried chiefly by vocational education departments of school systems in conjunction with local hospitals. On January 1, 1958, Minnesota had fifteen schools of practical nursing and six additional schools are expected to open during the year. A new development in Minnesota is the preparation of non-professional nursing personnel for the care of psychiatric patients.

Education for advanced professional nursing—administrative, teaching, supervisory, and public health nursing—is centered in the University of Minnesota which trains more teachers of nursing than any other institution in the country.

Rural community nursing is a part of the basic educational program of many schools of nursing in Minnesota. Experience for students is provided through affiliation with community hospitals outside the metropolitan areas of the state. Schools of nursing in Minneapolis, St. Paul, and Duluth assign students to community hospitals in Bemidji, Benson, Fairmont, Grand Rapids, Hibbing, Litchfield, Pipestone, Sauk Centre, Sleepy Eye, Stillwater, Thief River Falls, and Worthington. The University of Minnesota provides the direction and co-ordination of this program.

Special educational nursing services in the state include extension classes, workshops, and institutes. Since 1951, the Minnesota State Student Nurse Scholarship Act has provided more than 1,600 scholarships.

Medical Technology

Although in the past few years the number of students completing requirements for the four-year degree program in Medical Technology has

(Continued on Page A-58)

"hand-itis"
yes, any rheumatic "itis" calls for
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build-up for
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Improve appetite and energy

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strengthen bodies with needed protein

Through the action of L-Lysine, cereal and other low-grade protein foods are up-graded to maximum growth potential.

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with iron in the well-tolerated form of ferric pyrophosphate...plus sorbitol for enhanced absorption of both iron and B₁₂.

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cherry flavor—
no unpleasant
aftertaste

Average dosage is 1 teaspoonful daily. Available in bottles of 4 and 16 fl. oz.

Each teaspoonful (5 cc.) contains:

L-Lysine HCl	300 mg.
Vitamin B ₁₂ Crystalline	25 mcgm.
Thiamine HCl (B ₁)	10 mg.
Pyridoxine HCl (B ₆)	5 mg.
Ferric Pyrophosphate (Soluble)	250 mg.
Iron (as Ferric Pyrophosphate)	30 mg.
Sorbitol	3.5 Gm.

LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

*Reg. U. S. Pat. Off.



COMMITTEE ACTION

(Continued from Page A-56)

been below normal, the present indication of slight increases in the number of students in this program is encouraging.

The increasing need in the state for the services of the professional graduate Medical Technologist serves to emphasize the present critical shortage of laboratory personnel. Continued and vigorous efforts toward recruitment of students are urgently recommended.

Laboratory Aide Program

During the past year, the Laboratory Aide Program has been expanded by the inclusion of five additional hospitals outside the Twin Cities area for clinical training of students. Newly participating hospitals include St. Francis Hospital, Crookston; Fairmont Community Hospital; Lake Region Hospital, Fergus Falls; St. Francis Hospital, Breckenridge; and Veterans Administration Hospital, Minneapolis.

General awareness of the Laboratory Aide Program appears to be increasing, and enrollment in it may be expected to rise. Future expansion of the program should be contemplated if necessary financial support is available.

HAROLD S. DIEHL, *Chairman*



...This man is on the job everyday!

Wrist diarticulation did not mean the end of job income and satisfaction for this man. With a modern WINKLEY prosthesis, designed to his exact specifications, this man is able to work efficiently all day long. The years of design engineering and prosthetic research undertaken by The Winkley Company provide the arms and legs that once again result in normal activity for most amputees. Doctors and amputees are invited to visit our modernized facilities and see a demonstration of our new fitting apparatus.



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COMMITTEE ON OPHTHALMOLOGY

During the year 1957, the Committee on Ophthalmology, under the chairmanship of Dr. T. R. Fritzsche, sponsored an educational exhibit at the 1957 state meeting stressing the importance of proper eye care for children and attempting to impress the general practitioner with the following information:

1. An alert nurse-parent-teacher combination and use of the Snellen Chart are all that is necessary to do an excellent job of visual screening of school children. Elaborate instruments are too complicated for young children, resulting in too many false positive cases and thereby in unnecessary glasses—if these cases fall into unscrupulous hands.
2. Early examination of children in which there is a family history of strabismus, amblyopia (poor vision), strong lenses, cataract, or other eye diseases.
3. Strabismus is best dealt with as soon as discovered.
4. The ultimate goal is pre-school examination of four year olds, as visual improvement of amblyopia is seldom successful after age five.
5. Early referral of infants with tearing, photophobia, discharge, or other abnormalities.
6. Cycloplegic examination is the only reliable way to examine infants and children for refractive errors.

The committee has frequently been informed of attempts on the part of optometrists in the state to take over the visual screening of school children in place of the designated specially-trained school nurses in certain communities. This has been true especially in areas with a shortage of school nurse personnel.

There have been an increasing number of optometrists who have found their way to membership on school boards, and into officer positions in the parent-teacher organizations. From there, it has been possible for them to promote optometrist-testing programs, and thus prescribe glasses and carry on so-called visual training programs. The committee wishes to call attention to the entire adequacy of the public health nurse system in finding school children who need visual care. It is to be hoped that they will receive the enthusiastic support of the medical profession.

The committee also condemned the matter of optometrist's giving psychological treatments to mentally retarded children in several communities.

In the forthcoming year, the committee is investigating the possibilities of promoting the testing of pre-school children in the endeavor to detect ocular defects which may be better treated in the years prior to their beginning school.

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Tao

(brand of chloramphenicol with guaiacoline)
Capsules / Oral Suspension

designed
for
effective
control of
common
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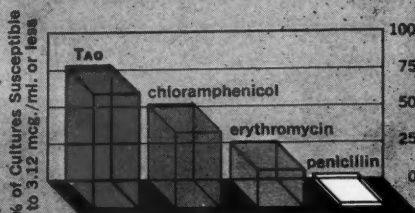
effective ...

CLINICAL RESULTS	adults	children	all Staph infections
Cured	172 (80%)	148 (89%)	71 (88%)
Improved	28 (13%)	8 (5%)	7 (9%)
Failure	17 (7%)	11 (6%)	3 (3%)

Types of infecting organisms: The majority of identified etiologic microorganisms were *Staph. aureus* and *Staph. albus*. Tao has its greatest usefulness against organisms such as: staphylococci (including strains resistant to other antibiotics), streptococci (beta-hemolytic strains, alpha-hemolytic strains and enterococci), pneumococci, gonococci, *Hemophilus influenzae*.

even
against
resistant
staph 1,2...

Per cent of "antibiotic-resistant" epidemic staphylococci cultures susceptible to Tao, erythromycin, penicillin and chloramphenicol.¹



well
tolerated ...

REACTIONS:

(a) adults
Total—9.2%
(20 out of 217)
Skin rash—1.4%
(3 out of 217)
Gastrointestinal—
7.8% (17 out of 217)

(b) children
Total—0.6%
(1 out of 167)
Skin rash—none
Gastrointestinal—
0.6% (1 out of 167)

There was complete freedom from adverse reactions in 94.5% of all patients. Side effects in the other 5.5% were usually mild and seldom required discontinuance of therapy.

plus ...

stability in gastric acid • rapid, high and sustained blood levels • high urinary concentrations • outstanding palatability in a liquid preparation

Dosage and Administration: Dosage varies according to the severity of the infection. For adults, the average dose is 250 mg. q.i.d.; to 500 mg. q.i.d. in more severe infections. For children 8 months to 8 years of age, a daily dose of approximately 30 mg./Kg. body weight in divided doses has been found effective. Since Tao is therapeutically stable in gastric acid, it may be administered at any time, without regard to meals.

Supplied: Tao Capsules—250 mg. and 125 mg.; bottles of 60. Tao for Oral Suspension—1.5 Gm.; 125 mg. per teaspoonful (5 cc.) when reconstituted; unusually palatable cherry flavor; 2 oz. bottle.

References: 1. English, A. R., and Fink, F. C.: *Antibiotics & Chemother.* (Aug.) 1958. 2. English, A. R., and McBride, T. J.: *Antibiotics & Chemother.* (Aug.) 1958. 3. Wennersten, J. R.: *Antibiotic Med. & Clin. Therapy* (Aug.) 1958. 4. Celmer, W. D., et al.: *Antibiotics Annual 1957-1958*, New York, Medical Encyclopedia, Inc., 1958, p. 476.

Meetings and Announcements

STATE

Conference on Electrical Techniques in Medicine and Biology, eleventh annual session, Nicollet Hotel, Minneapolis, November 19, 20 and 21, 1958.

NATIONAL

American College of Surgeons sectional meetings:

Charleston, South Carolina, January 19, 20, 21, 1959

Houston, Texas, February 2, 3, 4

Vancouver, British Columbia, February 26, 27, 28

St. Louis, Missouri, March 9-12 (four-day meeting; joint Nurses Sessions)

Montreal, Quebec, April 6-9 (four-day meeting; joint Nurses Sessions)

Chicago Medical Society, Postgraduate Courses, 86 E. Randolph Street, Chicago 1, Illinois. Medicine—October 27-31, 1958, and Surgery—November 3-7, 1958.

Fifth Annual Conference of Mental Health Representatives of the State Medical Associations sponsored by the AMA Council on Mental Health, November 21 and 22, 1958, Drake Hotel, Chicago.

Gerontological Society, Inc., Bellevue Stratford Hotel, eleventh annual scientific meeting, Philadelphia, Pennsylvania, November 6, 7, and 8, 1958.

Medical Society of the State of North Carolina 105th Annual Sessions, George Vanderbilt Hotel, Asheville, North Carolina, May 3-6, 1959.

National Society for Crippled Children and Adults, 1958 convention, November 16-20, Statler Hotel, Dallas, Texas.

Second Oklahoma Colloquy on Advances in Medicine, Arthritis and Related Disorders, University of Oklahoma School of Medicine, Oklahoma City, Oklahoma, November 12, 13, 14 and 15, 1958.

Western Surgical Association, annual meeting, Hotel Kahler, Rochester, November 20, 21 and 22, 1958.

INTERNATIONAL

International College of Surgeons, southeastern regional meeting, Miami Beach, January 4-7, 1959. For information, write to Harold O. Hallstrand, M.D., 7210 Red Road, South Miami, Fla., chairman.

AMA READING MATERIALS AVAILABLE

Additional quantities of the following previously listed AMA leaflets are available without charge: "The Fifth Freedom" points out the importance of the patient's right to choose the doctor who will best serve his family. The other, "Do You Like to Make Decisions?" stresses the role of the physician's judgment in prescribing personalized care suited to the patient's needs. Also available without charge: "To All My Patients." A simple informative booklet which discusses the various aspects of a good doctor-patient relationship.

The leaflets are suitable for distribution to office patients and as enclosures to be mailed with statements.

Forward requests to Minnesota State Medical Association, 496 Lowry Medical Arts Building, Saint Paul 2, Minnesota.

AMA CLINICAL MEETING IN MINNEAPOLIS

More than 3,000 physicians are expected to attend meetings of the twelfth clinical meeting December 2 to 5, in Minneapolis.

Practical information for daily use by general practitioners will be highlighted in the program activities.

The house of delegates of the AMA will conduct its sessions at the Leamington Hotel.

The Minneapolis Auditorium will house scientific and technical exhibits.

AMA's council on scientific assembly is in charge of the meeting. Dr. Alphonse McMahon, St. Louis, is Chairman; Dr. Thomas Hull, Secretary, and George Larson, Convention Services Manager.

Dr. O. L. Norman Nelson, President of the Hennepin County Medical Society, is the local general chairman for the clinical meeting. Local scientific program chairman is Dr. Neal L. Gault, Director of post-graduate education at the University of Minnesota Medical School.

Minnesota's Governor, Orville L. Freeman, will address the house of delegates. Dr. Horatio B. Sweetser, President of the Minnesota State Medical Association, will extend the welcome on behalf of the State Association.

VAN METER PRIZE AWARD ANNOUNCED

The American Goiter Association again offers the Van Meter Prize Award of \$300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the Association which will be held in the Drake Hotel, Chicago, Illinois, April 30, May 1 and 2, 1959.

The competing essays may cover either clinical or research investigations, should not exceed 3,000 words in length and must be presented in English. Duplicate typewritten copies, double spaced, should be sent to the Secretary, Dr. John C. McClintock, 149½ Washington Avenue, Albany 10, New York, not later than January 15, 1959.

in all
diarrheas

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SUCCINYLSULFATHIAZOLE-NEOMYCIN SUSPENSION WITH PECTIN & KAOLIN

EXPERIENCE

**MORE THAN
16 MILLION DOSES
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**regardless of
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MEETINGS AND ANNOUNCEMENTS

(Continued from Page A-60)

CONTINUATION COURSE

The University of Minnesota announces a continuation course in Pediatric Radiology for Radiologists which will be held on the University campus from November 3 to 7, 1958. The course will be held in the Mayo Memorial Auditorium in the University of Minnesota Medical Center on the Minneapolis Campus.

STATE FAIR POLIO PROTECTION PROJECT

A total of 4,959 persons over the age of twenty-one years received their first Salk polio shot at the Minnesota State Medical Association State Fair booth during the ten-day 1958 event.

In addition, approximately 7,000 family health records, 6,000 individual health records, and 4,500 "Know Your Doctor" booklets were distributed.

To Eli Lilly and Company, the Minnesota State Medical Association extends sincere appreciation for making the necessary Salk vaccine available without charge.

Additional acknowledgments are extended to the members of the Academy of General Practice, for volunteering their services by administering shots to State Fair goers; to the Minnesota Nurses Association and Twin City Hospitals for providing nursing staffs; Minneapolis Health Department, syringes; and the Minneapolis Council of Jewish Women, registration personnel.

Much of the success enjoyed by the project may be attributed to the attention received from Minnesota radio and television stations and the daily and weekly press.

Personal physicians of individuals receiving the initial polio shot at the State Fair have been notified by mail, in order to facilitate follow-up shots.

Sample copies of follow-up cards designed for the convenience of the physician are enclosed with the September Newsletter. These cards are available without charge from the State Office or from Eli Lilly and Company representatives.

RANGE MEDICAL SOCIETY GRANTED STATE CHARTER

Minnesota's newest medical society, the Range Medical Society, was chartered August 26, in Grand Rapids.

With a membership of approximately 100 medical men, the new organization previously was known as the Iron Range division of the St. Louis County Medical Society. Its scope runs from Grand Rapids to Ely on the Iron Range, plus Koochiching County.

The charter was presented to the organization president, Dr. O. C. Braun, Grand Rapids, at a dinner meeting at the Rainbow Club in Grand Rapids by Dr. Clarence Jacobson, Chisholm, councilor for the Minnesota State Medical Association. Other officers are Dr. Arthur M. Antonow, Virginia, vice president, and Dr. R. T. Kelly, Grand Rapids, secretary-treasurer.

Organization of the society is a result of an amicable agreement involving Iron Range doctors and members of the St. Louis County Medical Society. It was decided that an autonomous group was advisable as a matter of

convenience. Formation of the new group came to a head this spring when it was decided to apply for a state charter.

Present officers of the new organization took over last January 1 as officers of the Iron Range division of the St. Louis County group. They will carry on until the next election.

Headquarters of the Range medical group is in Hibbing. Meetings are held six times a year and generally include a scientific program. Meetings are generally conducted at Hibbing, Virginia, or Grand Rapids.

At the first meeting, Dr. Cy Barnum of the University of Minnesota discussed present lines of research in the fight against cancer.

Dr. Horatio B. Sweetser, president of the Minnesota State Medical Association, and Dr. John C. Feuling, president of the St. Louis County Medical Society, were guests at the dinner.

The St. Louis County Medical Society embraces not only the southern half of the county but also Lake, Cook and Carlton Counties.

SISTER KENNY DOCTORAL SCHOLARSHIPS OFFERED

The Sister Elizabeth Kenny Foundation announces continuation of its program of post-doctoral scholarships to promote work in the field of neuromuscular diseases. These scholarships are designed for scientists at or near the end of their fellowship training in either basic or clinical fields concerned with the broad problem of the neuromuscular diseases.

The Kenny Foundation Scholars will be appointed annually. Each grant will provide a stipend for a five-year period at the rate of \$5,000 to \$7,000 a year depending upon the scholar's qualifications. Candidates from medical schools in the United States and Canada are eligible.

Inquiries regarding details of the program should be addressed to: Dr. E. J. Huenekens, Medical Director, Sister Elizabeth Kenny Foundation, Inc., 2400 Foshay Tower, Minneapolis 2, Minnesota.

GOVERNOR CALLS SECOND CONFERENCE ON AGING

Thanks to the first Governor's Conference on Aging in 1956, Minnesota was alerted to the tremendous growth in the number of elderly people. The Conference also dramatically outlined the problems which have accompanied this growth in the number of our senior citizens.

Now the second Governor's Conference on Aging has been called by Governor Orville Freeman, to be held November 20-21, at the Lowry Hotel, St. Paul, Minnesota. Registration is two dollars.

This second conference, supported by eight nationally prominent speakers in the field of aging, will concentrate on how to achieve community action to "Extend the Independent Years." Workshops on community action, health, employment and housing will be featured.

For further information, write Bernard E. Nash, Special Consultant on Aging, State Department of Public Welfare, St. Paul 1, Minnesota.

Woman's Auxiliary

COUNTY AUXILIARIES URGED TO APPOINT LEGISLATIVE CHAIRMEN NOW

All county auxiliaries are urged to appoint a legislative chairman in order that they may receive timely legislative information.

Forward names and addresses of appointees to either of the co-chairmen: Mrs. L. Raymond Scherer, 1930 Irving Avenue South, Minneapolis, or Mrs. L. R. Boies, 410 Cottage Downs, Hopkins.

CLAY AND BECKER COUNTY AUXILIARIES HOSTESSES TO MEDICAL ASSOCIATION

The auxiliaries of Clay and Becker counties were hostesses to the doctors' wives when the Northern Minnesota Medical Association met at Detroit Lakes, September 5 and 6. Thirty-three women attended a luncheon at the Detroit Lakes Country Club. A boat trip had been planned for the afternoon, but due to inclement weather, the women played bridge instead.

Mrs. John Rutledge, Detroit Lakes, President of the Becker County Auxiliary and Mrs. J. W. Duncan, Moorhead, President of the Clay County Auxiliary, were in charge of arrangements.

Guests at the luncheon included Mrs. Reuben Erickson, Minneapolis, President of the State Medical Auxiliary; Mrs. Gilman Goehrs, St. Cloud, state treasurer, and Mrs. C. E. Carlson, Alexandria, 8th district regional adviser.

On Saturday morning, Mrs. Arnold Larson, Detroit Lakes, graciously opened her home for the women for forenoon coffee.

RANGE COUNTY MEDICAL AUXILIARY

The first meeting of the Range Medical Auxiliary was held on Thursday, September 25. The Range Auxiliary now has its own charter and its members will no longer be affiliated with the St. Louis County Auxiliary. Mrs. Reuben Erickson, Minneapolis, State Auxiliary President, attended this first meeting which was held at Hibbing.

Mrs. L. W. Johnsrud, Hibbing, is the president of the new Range Medical Auxiliary.

SOUTHWESTERN MINNESOTA AUXILIARY

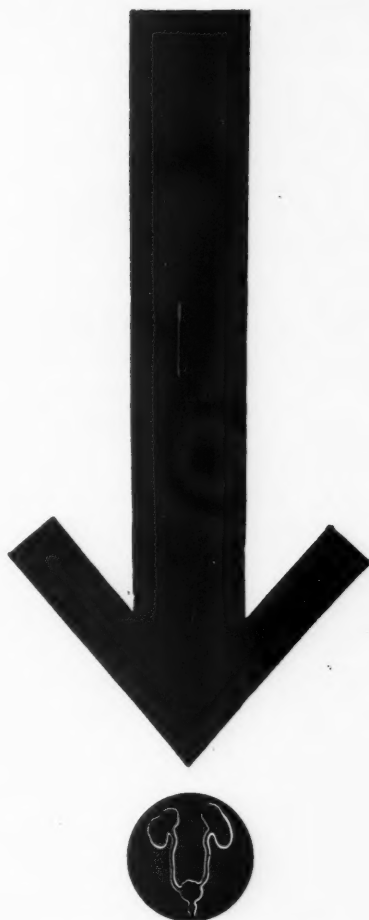
The Southwestern Minnesota Auxiliary had its first meeting of the year at Worthington, on September 22. Mrs. Raymond Scherer, Minneapolis, legislative chairman for the State Medical Auxiliary, reported on the medical legislation that will be forthcoming in the next state legislature and congress.

Mrs. Reuben Erickson brought greetings to the wives as president of the State Medical Auxiliary.

AMA AUXILIARY ACTIONS

Attendance at the annual meeting of the Auxiliary to the American Medical Association, held in San Francisco, June 23-27, exceeded the 2,100 mark.

Four hundred and eighty delegates, forty-seven state



IN THE MANAGEMENT OF
URINARY TRACT INFECTIONS
YOU CAN BE SURE WITH ®

SUROMATE

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NEW TRIPLE SULFA WITH THE DOUBLE PLUS

EACH TABLET CONTAINS: Superior, broad-spectrum antiseptics. Highly soluble, rapidly absorbed, maintains high g.u. concentrations. Effective in low dosages with minimal risk of crystalluria, sensitization, resistance or superinfection.

Sulfadiazine 100 mg.
 Sulfamerazine 100 mg.
 and
 Sulfacetamide 100 mg.

†Ext. Hyoscymus 5.75 mg.
 (alkaloids 0.155%)

†Potassium citrate 200 mg.

SUPPLIED: Bottles of 100 tablets.

Prompt antispasmodic and anti-irritant relief of pain and urgency.

Diuresis and alkalization to enhance sulfonamide solubility and safety.

[patch] THE E. L. PATCH COMPANY
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70 YEARS OF SERVICE TO THE MEDICAL PROFESSION




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MEDIA
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**ACCELERATE THE
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presidential delegates, and 1,131 members were included in the total attendance figure.

The House of Delegates accepted a revision of the By-laws which would change the name of the organization to the Woman's Auxiliary to the American Medical Association.

A change in the ratio of national delegates was amended to include one delegate for every three hundred members or major fraction thereof.

Members were told that contrary to popular conception or misconception, the AMA is not opposed to all federal health legislation. It was pointed out that in the 84th Congress, twenty-two health bills were passed with the AMA supporting nineteen of them.

The medical profession is against the Forand bill, but is in favor of care of the aged. We believe that the first responsibility should be that of the family. As a positive approach to this problem, the AMA has formed the Joint Council on Health Care of the Aged to survey the actual needs and make the necessary recommendations. At this time no agency, federal or otherwise, has the accurate facts on this subject. The council is composed of the American Hospital Association, the American Dental Association, the American Nursing Home Association, and the American Medical Association.

Mrs. E. Arthur Underwood, on taking office as president, stated that "Safeguard Today's Health for Tomorrow" would be the theme for this year. Three areas were suggested for possible expansion of community service: (1) the physical and emotional health of preschool children, (2) the needs of older people, and (3) nutritional education.

Mrs. Frank Gastineau, of Indianapolis, Indiana, was chosen to serve as president-elect.

RANGE MEDICAL AUXILIARY INTRODUCES SLOGAN, OFFICERS

"Safeguard today's health for tomorrow" is the slogan the Range Medical Society Auxiliary will be following this year, it was announced at the group's membership luncheon held recently at the home of Mrs. R. A. Murray, Hibbing.

The new slate of officers, introduced following the lunch includes: Mmes. L. W. Johnsrud, president; R. T. Kelly, Grand Rapids, vice president; L. W. Morseman, corresponding secretary; B. F. Flynn, recording secretary; W. H. Parker, Chisholm, treasurer; T. Schweiger, historian; O. M. Wilbur, auditor; L. G. Thouin, publicity; R. A. Murray, parliamentarian.

Special guests present at the meeting were Mrs. R. E. Erickson, Minneapolis, president of the State Medical Association Auxiliary; Mrs. M. F. Fellows, Duluth, president-elect of the Auxiliary, and Mrs. G. J. Strewler, Duluth, president of the St. Louis County Medical Auxiliary.

Outstanding projects on this year's agenda were announced as the American Medical Education Foundation, safety, para-medical careers, community services and *Today's Health* magazine.

The next meeting will be held Tuesday, October 28, in Hibbing.

HE NEEDN'T BE HIGH-STRUNG

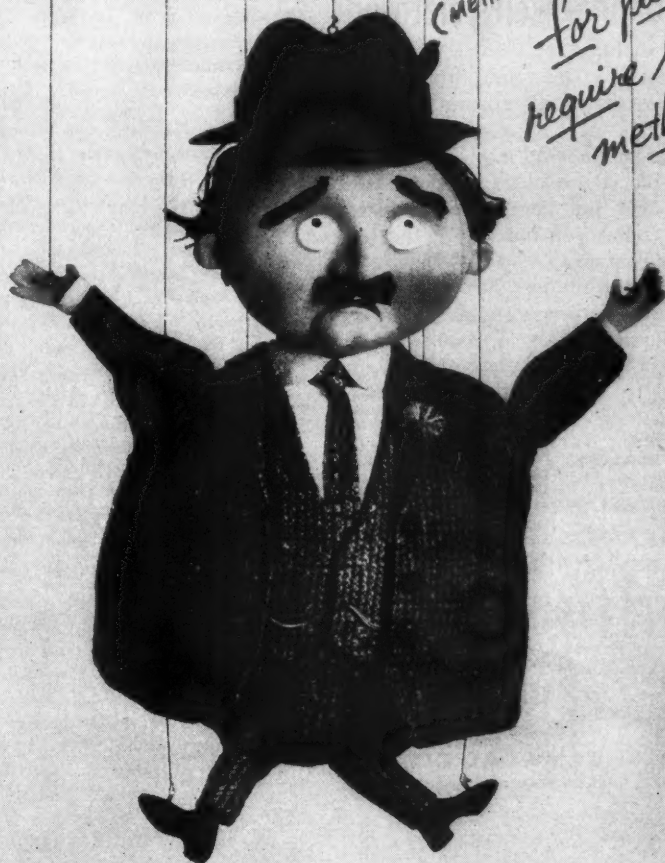
WEIGHT REDUCTION: Obese patients may resist dieting because they fear losing the emotional security often involved in overeating. AMBAR helps them hold the diet line by giving them a more alert, brighter outlook. **WITHOUT JITTERS:** Methamphetamine, a potent CNS augmentor, produces less cardiovascular effect than amphetamine. In AMBAR it is combined with just enough phenobarbital to prevent overstimulation. AMBAR EXTENTABS provide 10-12 hours of appetite suppression in one controlled-release, extended-action tablet: methamphetamine hydrochloride, 10.0 mg.; phenobarbital (1 gr.) 64.8 mg. AMBAR TABLETS for conventional dosage or intermittent therapy contain methamphetamine hydrochloride, 3.33 mg.; phenobarbital ($\frac{1}{2}$ gr.) 21.6 mg. A. H. ROBINS COMPANY, INC., Richmond, Virginia, Ethical Pharmaceuticals of Merit Since 1878

WEIGHT REDUCTION WITHOUT JITTERS AMBARTM

methamphetamine and phenobarbital
TABLETS AND EXTENTABS



Now available
NEW AMBAR^{#2}
EXTENTABS
(METHAMPHETAMINE 15 mg., PHENOBARBITAL 1 gr.)
for patients who
require higher
methamphetamine
dosage





Iron

In a semi-fluid state—it's quickly absorbed and well tolerated

Hematovals therapy for refractory hypochromic anemia provides semi-fluid iron in a soft, elastic capsule for rapid absorption without gastric irritation.

Each capsule supplies 58 mg. of ferrous ionic iron. Normal blood levels are quickly restored. Achlorhydria does not complicate Hematovals therapy because the iron remains in the ferrous state during conversion.

The cobalt factor induces better hemoglobin synthesis and quicker response. Hematovals also contain vitamin B₁₂, folic acid, liver and B-complex factors to help overcome anorexia. Assimilation is assisted by the ascorbic acid present in each Hematoval.

EACH CAPSULE CONTAINS:

Ferrous Sulfate, 4.5 gr.
Iron.....58 mg.
Cobalt Sulfate 2.0 mg.
Cobalt.....0.4 mg.
Liver, Desiccated, N.F.....110 mg.
Vitamin B₁₂.....1 mcg.

Folic Acid.....0.25 mg.
Thiamine Mononitrate.....1 mg.
Riboflavin.....1 mg.
Pyridoxine Hydrochloride.....0.25 mg.
Calcium Pantothenate.....0.25 mg.
Nicotinamide.....3.3 mg.
Ascorbic Acid.....16.66 mg.

Hematovals®



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THE ULMER PHARMACAL COMPANY

1400 HARMON PLACE, MINNEAPOLIS 3, MINNESOTA

In Memoriam

HENRY FREDERIC HELMHOLZ, SR.

Dr. Henry F. Helmholtz, Sr., head of the Section of Pediatrics at the Mayo Clinic from 1921 to 1946, died in the Methodist Worrell Hospital in Rochester, August 19, 1958, at the age of seventy-five years.

Dr. Helmholtz was born in Chicago, Illinois, and received the degree of Bachelor of Science from the University of Wisconsin in 1902, and that of Doctor of Medicine in 1906 from the Johns Hopkins University, where he also served as a fellow in pathology in 1906 and 1907.

From 1907 to 1909, Dr. Helmholtz did graduate work in medicine at the University of Berlin, University of Breslau and University of Vienna, returning to Chicago to enter the practice of pediatrics in that city. He was assistant professor of pediatrics in Rush Medical College in Chicago from 1910 to 1920, medical director of the Infant Welfare Society of that city for the same period, and a member of the Otho S. A. Sprague Memorial Institute for Medical Research from 1912 to 1920.

Dr. Helmholtz came to Rochester on January 1, 1921, as chief of the Section of Pediatrics. He became a senior consultant at the Mayo Clinic on July 1, 1946, and served as professor of pediatrics in the Mayo Foundation Graduate School, University of Minnesota, from 1921 to his retirement in 1949.

Dr. Helmholtz was a member of the Minnesota State Medical Association (Fifty Club), the American Medical Association, the American Pediatric Society, the Northwest Pediatric Society, the American Society of Pharmacology and Experimental Therapeutics, the American Academy of Pediatrics, the American Physiological Society, the American Association of Bacteriologists and Pathologists, the Society for Research in Child Development, the National Research Council, the American Child Health Association, the Alumni Association of the Mayo Foundation, the Society of the Sigma Xi, Phi Beta Kappa, the Alpha Omega Alpha medical honor society and the Chi Psi academic fraternity. He was also a member of the Executive Council of the Governor's Committee on Children and Youth of the State of Minnesota, state chairman of the Exceptional Child of the Minnesota Parent-Teacher Association and a member of the Minnesota Council for the gifted child. He is an associate member of the American Urological Association.

Survivors include his wife, Isabel; four children—Dr. Henry F. Helmholtz, Jr., a member of the Section of Physiology of the Mayo Clinic; Margaret (Mrs. Howard B. Burchell), Rochester; Dr. Lindsay Helmholtz, professor of physics in the University of California; and Dr. August Carl Helmholtz, II, associate professor of chemistry in Washington University, St. Louis, Missouri.

IN MEMORIAM

WADE R. HUMPHREY

Dr. Wade R. Humphrey, Stillwater physician, died August 23, 1958, at the age of seventy-nine, following an extended illness in Lakeview Hospital. He had been a practicing physician in Stillwater since 1906.

A native of Bluemont, Virginia, he received his preliminary education at Randolph-Macon Academy, Front Royal, Virginia, and at Randolph-Macon College, Ashland, Virginia. His medical education was obtained at the University of Maryland. Additional special work included one year of residency at University Hospital in Baltimore. He also headed postgraduate work at New York Poly Clinic and New York Post Graduate.

Dr. Humphrey was a member of the Washington County Medical Society, the Fifty Club of the Minnesota State Medical Association, the Elks and Masonic Lodges, and an honorary member of the Rotary Club.

Surviving are his wife, Luella, and one sister, Mrs. Robert James of Round Hill, Virginia.

JAMES S. McCARTNEY

Dr. James S. McCartney, Golden Valley, a professor of pathology at the University of Minnesota, died August 30, 1958. He was sixty-five years old.

A native of Tarentum, Pennsylvania, he was a graduate of Washington and Jefferson College, Washington, Pennsylvania, and Johns Hopkins Medical School.

Dr. McCartney joined the University of Minnesota faculty after service in the Army Medical Corps in France during World War I and as a fellow at the Mayo Foundation in Rochester.

Dr. McCartney was president of the State Board of Examiners in the Basic Sciences.

He was a member of the American Association of Pathologists and Bacteriologists, the College of American Pathology, the American Association for Cancer Research, the Minnesota Society of Clinical Pathology, the Minneapolis Academy of Medicine, Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association, and Phi Beta Pi fraternity.

Survivors include his wife, Naomi Hough McCartney; two sons, James S., St. Paul, and William H., Wayzata; four sisters, Mrs. Austin Lee George, Alice McCartney, Mrs. A. Copeland Campbell, all of Pittsburgh, Pennsylvania, and Mrs. Herbert Sackville, Dallas, Texas.

PENICILLIN CURB

World Health Organization has proposed sale and use of penicillin to be put under medical control. It said in U. S. alone 1,000 persons had died by 1957 after improper use of the drug. Statistically, not more than 25 of every 10 million shots lead to serious consequences, and only three of them may be fatal, WHO report said. —AMA News, Oct. 6, 1958.

a new white, super absorbent TREATMENT TOWEL

P&H



- Lint free
- Sanitary
- Pure white
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Communications

Dear Dr. Wells:

This fall University of Minnesota Television will feature a new series of thirteen programs in co-operation with the University's Department of Psychiatry. The series "Understanding Human Behavior" will be presented by Dr. Bernard C. Glueck, Jr., Associate Professor of Psychiatry. Dr. Glueck will discuss the fundamental patterns of human behavior from the point of view of adaptational psycho-dynamics. We feel the series will be both interesting and profitable to the viewer. Therefore, we would appreciate an announcement of the series and any publicity you can give us in *MINNESOTA MEDICINE*.

"Understanding Human Behavior" starts Tuesday evening, October 7, on University of Minnesota Television over KTCA-TV, channel 2, and continues every Tuesday evening through December 30.

Thank you for your co-operation.

Minneapolis, Minnesota
September 16, 1958

MRS. JEAN LOWE,
Program Supervisor

To the Editor:

I have recently had a number of inquiries concerning the editorial written by Donald Cordes in *MINNESOTA MEDICINE* for July, 1958, pages 504-505. I understand that many pathologists, particularly in the Twin Cities area, as well as many of the radiologists and internists, are much concerned about the appearance of this article. They are feeling that it was reviving a very touchy subject which they believe was quite undesirable. They have asked me to contact you as editor-in-chief to see if you had a particular reason for inviting this type of editorial.

Please be assured that I am speaking not for myself as an individual, but for the group as a whole. However, I am somewhat in agreement with their position but I can see that such a subject has to be discussed from both sides. If you can clarify this problem for me, it will be very much appreciated.

L.A.W.

EDITOR'S NOTE: Mr. Cordes' editorial, "The Hospital and Medical Practice—Administration Viewpoint," was published one year after its unsolicited receipt for the following reasons:

1. A solicited reply to the Cordes' editorial written by an officer of the Iowa State Medical Society was finally received and published in the same issue of *MINNESOTA MEDICINE*.

2. In the past five years, five editorials have appeared in *MINNESOTA MEDICINE* presenting the physician's viewpoint.

3. Mr. Donald Cordes was one of the most active and outspoken of the Hospital Administration forces in the Iowa dispute.

4. His reasoning or lack of it must represent the accumulation of most of the important thought of the American Hospital Association and its membership.

5. A careful analysis of the editorial will reveal a complete lack of appreciation of the physician's viewpoint, and the obvious omission of the principal reason for the medical control of the practice of medicine, hence the weakness of the hospital administrator's arguments. Mr. Cordes completely avoids the principal issues and plays up the greed of man.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

6. The Minnesota State Medical Association has been confronted by this illegal and illogical practice of medicine by the layman for years. The House of Delegates took its first action to correct the mistakes of the past at its May meeting, (see editorial in August issue, *MINNESOTA MEDICINE*).

7. The physicians of Minnesota are quite capable of analyzing Mr. Cordes' motivations and reasoning as they apply to the kind of medical care which is likely to be most beneficial to the people.

DUTIES, OBLIGATIONS AND RESPONSIBILITIES OF THE CORONER AND DEPUTY CORONERS

It is essential that the Coroner respond to summons at any time, night or day, Sundays or holidays. His jurisdiction comprises all of Ramsey County.

The call will come from the Saint Paul Police Department, from the Ramsey County Sheriff's office, from a funeral director or a member of the deceased's family, or possibly from a neighbor or passerby who has discovered a body. The Coroner or his deputies must respond to these calls immediately. Delay in most cases works a hardship on the law-enforcement agencies involved and on the relatives and friends of the deceased. The Coroner or his deputies should be prepared for any eventuality; this includes always having with him the miscellaneous blank forms furnished by the Coroner's office.

The person taking the call for the Coroner's office must ascertain the time of call, the location where the body may be, and should get all the information which may help him in his investigation in the future. If there is no police officer at the scene, it is advisable for the deputy coroner to ask the co-operation of the Police Department of the village or city. If the private physician of the deceased is at the scene, it is important to learn from him the past medical history and other pertinent facts about the deceased.

Any licensed doctor may make the pronouncement of death; but if the doctor has not seen the deceased within thirty days, he does not have the authority to sign the death certificate. He must furnish the Coroner's office with all the information he has pertinent to the case and the Coroner's office will have one of their medical deputies examine the deceased and make the diagnosis of death.

In many cases, the Coroner's office must send a hearse to the scene. For sake of convenience and economy, the Coroner's office hires the services of the Martin's Am-

Instructions given to deputies working under the supervision of the Ramsey County Coroner.

COMMUNICATIONS

balance Service. This requires Martin's Ambulance to send a hearse and driver to the scene; and in case there is more than one death, even three or four at the same time, they are required to send as many ambulances and drivers as the Coroner deems necessary.

It is the duty of the Coroner or deputy coroner to make a thorough examination of the body as soon as he comes on the scene. If he feels that further examination and investigation are required, he must remove the body to the Ramsey County Morgue. If the deputy thinks that the death was from natural causes, he may release the body to the funeral director designated by the surviving member or members of the family.

The deceased must be taken to the morgue if his death was the result of homicide, suicide, or accident, or where there is a suspicion of foul play.

It is desirable, though not always necessary, to obtain written consent from the next of kin of the deceased for an autopsy. The Coroner's office has specially prepared blanks for this purpose. A disinterested person, preferably a police officer or deputy sheriff, must witness such consent.

If the Coroner or deputy coroner has any suspicion that foul play is involved, he should remove any person or persons from the immediate vicinity. His next step should be to notify the homicide division, Saint Paul Police Department, and then ask the identification division to send one of their representatives to the scene to take pictures, to make measurements of the room, to note the position of the body, and to detain all possible witnesses that were near the scene at the time of death. It is very important to get the names, addresses, and phone numbers of all witnesses and of any other person or persons who may have some information concerning the death. In the case of suicide or accidental death, it is imperative that all past medical history should be acquired from the deceased's family physician and relatives. This enables the Coroner or his deputy to make a more accurate diagnosis of the cause of death.

It is the duty of the Coroner's office in the case of homicide, suicide, or accidental death to remove all effects from the body of the deceased. If the deceased was living alone, it is necessary to make a complete inventory of the effects in the deceased's room, apartment, or home, whichever it may be. Also to take possession of all valuables such as watches, rings, insurance policies, deeds, safety deposit keys, and all papers that are considered valuable by the investigating officer.

If there is any suspicion in the Coroner or deputy coroner's mind that the death was from unnatural causes, he should ask a pathologist under the Coroner's jurisdiction to perform an autopsy immediately.

If there are no relatives residing in this city or county, all possible efforts should be made to get in touch with out-of-county relatives, even at the cost of telephoning to any part of the United States or Canada. If there are any relatives of the deceased present at the scene and the death is natural, it is within reason to turn the apartment or home and the effects therein over to the nearest relative. The Coroner or deputy coroner should get a written release at this time. In the event there are no relatives living within

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the city or county, the home shall be thoroughly inventoried, all effects of value taken to the Coroner's office, and an off-duty police officer or deputy sheriff hired to protect that property and the effects within until we get a release from the Probate Court or an attache, presumably a lawyer. The apartment or home, whichever it may be, shall have the Coroner's seal placed on the door of any entrance or exit on the outside of building.

When the deceased is taken to the Ramsey County Morgue and the death is homicide, suicide, or accidental, it is mandatory that the Coroner or deputy coroner take a blood sample immediately. This blood sample should be taken to a private chemist, or the State Crime Bureau, to be checked for alcohol, barbiturates, and if necessary carbon monoxide gas poisoning. It is important that nothing about the body or where it is found is overlooked.

If there is any question in the Coroner's or deputy coroner's mind that there is evidence of foul play, everything should be left as it is and the proper authorities called into the case.

All these procedures must be carried out promptly and faithfully according to law so that we all may discharge our responsibilities properly to the community, as the work of the Coroner and his deputies is in essence a duty to society.

Doctor Henderson or his chief investigator, Tom Flaherty, must be called and advised about all homicides, suicides, and accidental deaths.

A. J. HENDERSON, M.D.
Ramsey County Coroner

General Interest

Dr. William H. Bickel, head of the Section of Orthopedic Surgery in the Mayo Clinic and associate professor of orthopedic surgery in the Mayo Foundation, Graduate School, University of Minnesota, left Rochester on August 31 to visit Army medical installations in France, Germany, and Italy in the capacity of orthopedic consultant to the Surgeon General of the U. S. Army. He presented lectures, made rounds with Army medical officers and saw individual patients.

* * *

The regular meeting of the Minnesota Society of Neurology and Psychiatry was held at the Town and Country Club in St. Paul, Tuesday, September 9. The scientific program presented included: "Stereotactic Surgery," Dr. Lyle French and Dr. Richard Strassburger; and "Tranquilizers and Changing Ecology in State Hospitals," Dr. Carl Koutsky.

* * *

Dr. Lloyd C. DeMarais joined the general surgical staff of the Mesaba Clinic on August 19.

* * *

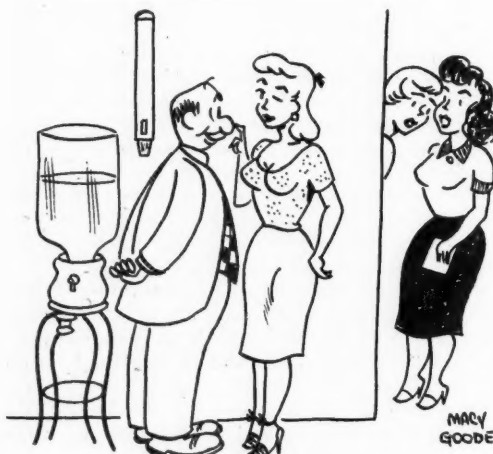
Dr. F. H. Magney, Duluth, delivered the graduation address at the School of Physical Therapy, Mayo Clinic, Rochester, on August 29.

* * *

Dr. Karl W. Anderson, president of the Minnesota Heart Association, was a speaker at a joint luncheon meeting of the Minnesota Heart Association and the Minnesota State Association of Life Underwriters, held on the University of Minnesota campus.

* * *

Dr. John Watkins and staff have completed the mov-



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ing of office and medical equipment into the new medical clinic on the corner of First Avenue and Second Street, S.W., in Wells.

* * *

Work has started on excavation for new office building and medical center by Dr. R. A. MacDonald of Littlefork. The new 30 x 50 foot building will provide modern offices, reception and examination rooms as well as x-ray and operating rooms when fully completed.

* * *

The staff of the Blue Earth Medical Center has announced the arrival of Dr. Arthur Sundberg. Dr. Sundberg fills the spot left open at the clinic with the recent departure of Dr. D. V. Smith, who has moved to Seattle, Washington. He joins Dr. George Drexler and Dr. John Anderson in the clinic.

* * *

Dr. Frederic J. Kottke, Minneapolis, was named president-elect of the American Congress of Physical Medicine and Rehabilitation at its convention in Philadelphia. Dr. Kottke, who is professor and head of the department of physical medicine at the University of Minnesota, will become president of the organization at the end of next year's convention in Minneapolis.

* * *

The Augustana Lutheran Church has commissioned two medical doctors for missionary service in Africa. They are Dr. Denis Lofstrom, Pine River and Dr. Joseph L. Norquist, Thief River Falls.

* * *

Dr. Donald E. Wohlraabe has begun the practice of medicine. He will be associated with his father, Dr. E. J. Wohlraabe in the latter's office in Springfield. Dr. Wohlraabe will specialize in the field of general surgery.

* * *

Dr. Francis Boyle, who has been practicing medicine at Tracy the last two years, has opened his new medical clinic in Springfield. The clinic is a one-story brick building, 30 x 46 feet. The air-conditioned clinic will include a waiting room, offices for two physicians, two examining rooms, an x-ray room, a room for minor surgery and therapy, and a bookkeeping room.

* * *

Dr. Raymond L. Page, St. Charles physician, and his wife were recently honored at a farewell community picnic held in the City Park of that community. Residents of Dover, Elba, Altura, Utica, Saratoga, and other surrounding areas participated in the gathering. Dr. Page recently completed thirty-one years of practice in St. Charles.

* * *

A "Dr. Ellison Recognition Day" was held Sunday, August 31, in the new high school auditorium in Monticello. The community project honored Dr. Frank Ellison, well-known physician who has served forty-

GENERAL INTEREST

seven years in the field of medicine. Of this time the doctor has served Wright and neighboring counties for forty-five years.

* * *

Dr. Hendrik DeKruif, who has been associated with the Fergus Falls Clinic since June, 1950, has left Fergus Falls for Meadville, Pennsylvania, where he will start a private practice in internal medicine.

* * *

Dr. John E. Quast of Fairfax has affiliated with the Long Prairie Clinic in Long Prairie, as of September 8. Other members of the group are Drs. A. H. Borgerson, M. E. Mosby and A. Erickson.

* * *

Dr. Walter A. Fansler, Minneapolis, was a guest speaker at the Washington State Medical Association meeting in Spokane, Washington, September 14. Dr. Fansler presented papers on "Polyps of the Colon" and "Hemorrhoids and Fissures."

* * *

New officers of the Northern and Southern Minnesota Medical Associations, elected at annual meetings of the two groups held in Detroit Lakes and Hutchinson, respectively, are as follows:

Northern.—**Dr. Ralph Eckman**, Duluth, president; **Dr. O. K. Behr**, Crookston, vice president; **Dr. C. L. Oppgaard**, Crookston, secretary-treasurer.

Southern.—**Dr. William O. Finkelnburg**, Winona, president; **Dr. E. Covell Bayley**, Lake City, first vice president; **Dr. C. G. Sheppard**, Hutchinson, second vice president; **Dr. G. R. Diessner**, Rochester, secretary-treasurer.

* * *

Dr. Henry W. Dodge, Jr., a member of the Section of Neurologic Surgery of the Mayo Clinic since 1951, has resigned that post and will engage in private research work.

* * *

Dr. James A. Schneider, recently a fellow in Radiology in Mayo Foundation and a lifelong resident of Rochester, has left that city and is now associated with Drs. Rees, Haslinger, Nichols and Blinn in the practice of radiology, Portland, Oregon.

* * *

Dr. Jack V. Wallinga, Minneapolis, was recently elected to the American Academy of Child Psychiatry. Also at the recent meetings of the American Orthopsychiatric Association in New York, he served as chairman of a session on the subject of "Group Therapy with Delinquent Adolescents" and reported on a study of the psychodynamics of adolescent auto theft offenders.

* * *

Dr. R. O. Sather, Crookston, was a recent guest speaker at the annual fall festival at the Pioneer Memorial Home in Erskine.

* * *

Dr. Edwin W. Gerrish became associated with the Klefsstad Clinic, Greenbush, as of September 1. He has been assistant professor of surgery and director of children's surgery at the University of Cleveland, Ohio, for the past eight years.



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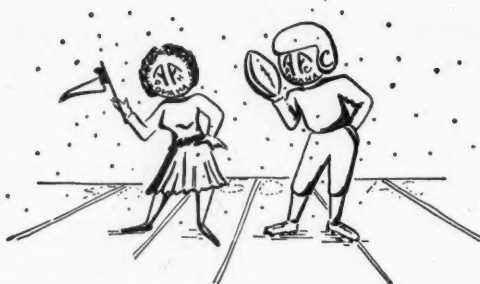
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Dr. Donald Mulder, a member of the staff of the Mayo Clinic in the section of neurology, was awarded the Southern Minnesota Medical Association medal for the best paper presented at the association's annual meeting in Hutchinson recently. His paper was on the subject, "Differential Diagnosis and Treatment of Epileptic Seizures."

* * *

Eden Valley residents recently paid tribute to Dr. D. C. O'Connor for his years of service to that community. Dr. O'Connor has practiced in his present position since 1911.

* * *

Dr. Leonard Arling has been named a director of the Hennepin County District of the American Cancer Society. He will fill a two-year assignment. Dr. James A. Johnson is district president.

* * *

Dr. J. A. Bargaen of the Mayo Clinic, president of the American Gastroenterological Association, was a recent speaker at the Scott and White Memorial Hospital, Temple, Texas. He addressed more than 100 doctors who trained as interns and residents there and former staff members of the hospital. Dr. Bargaen's subject was the problem of ulcerative colitis.

* * *

Half a century of medical service to Minnesota was recently noted as eighty-year-old Mankato physician, Dr. Adolph G. Liedloff was awarded an honorary membership certificate in the Minnesota Public Health Association by Dr. A. B. Rosenfield, director of the Division of Special Services, Minnesota Health Department, at the twelfth annual conference of the association, St. Paul Hotel, St. Paul.

* * *

The thirty-fourth annual meeting and reunion of the Alumni Association of the Mayo Foundation was held October 2, 3 and 4. General chairman of the event was Dr. W. G. Sauer. Members of committees: Program—Dr. D. R. Nichols, chairman, Drs. C. A. Owen and W. H. ReMine; Local Arrangements—Dr. G. A. Peters, chairman, Drs. H. J. Svien and G. D. Davis; Necrology—Dr. E. D. Bayrd, chairman; auditing—Dr. L. E. Ward, chairman; speaker—Dr. E. H. Ryncarson, chairman, Drs. O. T. Claggett and K. B. Corbin; nominating committee—Dr. L. O. Underdahl, chairman. Dr. James F. Weir is president of the association.

* * *

Recently honored for twenty-five years of service to the area was Dr. C. A. Boline, Battle Lake physician. More than 500 persons from the surrounding area gathered in the Battle Lake High School Auditorium for the event.

* * *

"Triketopyrimidine Metabolism" was the title of the paper presented by Robert P. Jeub and Ralph Rossen at the joint meeting of the Central and Eastern Electroencephalographic Societies on September 12, 1958. The meeting was held at the Toronto General Hospital, Toronto, Canada.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

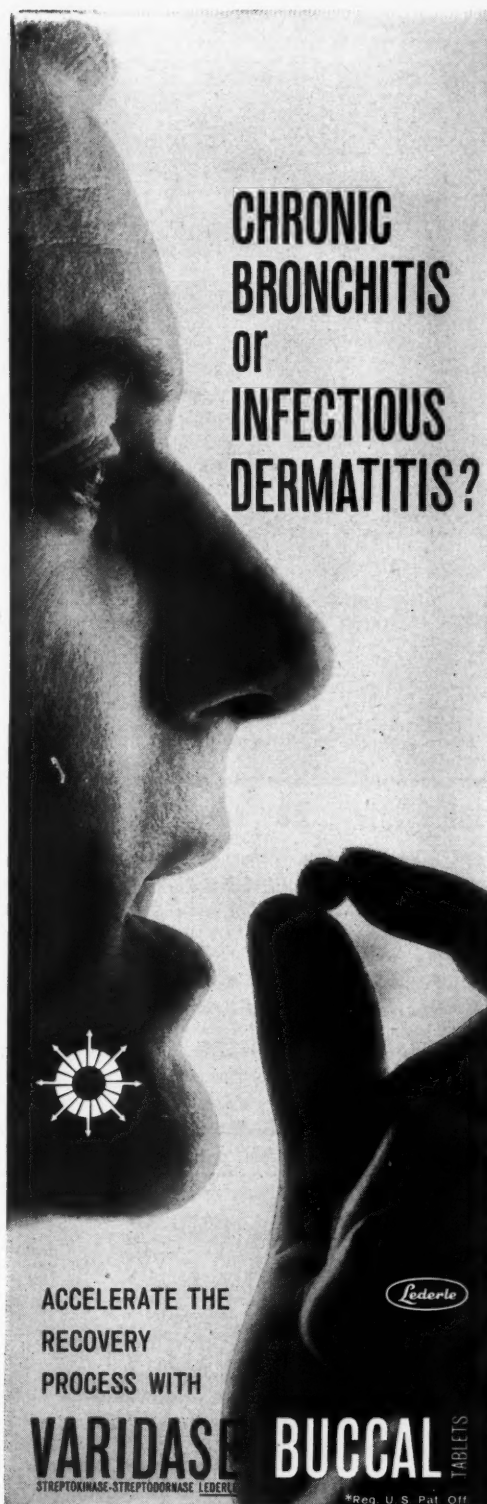
MINNEAPOLIS DENTIST SENTENCED ON BASIC SCIENCE CHARGE

Dr. Leonard V. Downing, sixty years of age, 100 Oakwood Rd., Hopkins, a licensed dentist in the State of Minnesota, entered a plea of guilty on September 19, 1958 before the Hon. D. E. LaBelle, Judge of the District Court of Hennepin County, to an information charging him with a violation of the Basic Science Act. Judge LaBelle at that time sentenced the defendant to a term of one year in the Minneapolis Workhouse and then stayed the execution of the sentence for one year.


The charge against the defendant Downing arose out of an investigation that had been conducted earlier this year after a 41-year-old Minneapolis widow, Elvira Bernice Nelson, had been hospitalized at Minneapolis General Hospital suffering from the effects of an incomplete abortion. When Mrs. Nelson did not co-operate with the authorities in naming the abortionist, she was charged with the crime of a pregnant woman attempting abortion for which she was sentenced on August 8, 1958 in Hennepin County District Court, pursuant to her plea of guilty, to one year in the State Reformatory for Women at Shakopee, the execution of the sentence being stayed for one year and the defendant placed on probation for the same period of time.

Later, it was discovered that Mrs. Nelson had been given a pelvic examination by Dr. Downing, whereupon he was arrested. Subsequently a complaint, which was issued by the Hennepin County Attorney's Office and signed by a representative of the Minnesota State Board of Medical Examiners, charged the defendant with having committed the crime of abortion. However, as stated above, the charge was reduced when further investigation indicated that the evidence would not warrant a finding of guilty of abortion in this case.

The defendant Downing, who maintains a dental office at 1406 W. Lake Street, Minneapolis was questioned by Judge LaBelle prior to being sentenced and he stated that he was a graduate of the University of Minnesota in dentistry and has practiced that profession for approximately thirty-eight years. Dr. Downing admitted that prior to 1930 he had performed from ten to thirteen abortions and that the highest fee that he received in any one case was \$100.00. The defendant also said that he did not know how the patient in this case had obtained his name but he acknowledged that he had examined her on one occasion, it being his opinion as a result of his examination that she was infected and had no need for an abortion. Although Dr. Downing admitted that he had asked \$500.00 for his services, he maintained that he did not receive any money. There was no evidence that he had actually been paid a fee in this case.



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Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED

BACTERIAL AND MYCOTIC INFECTIONS OF MAN. Third Edition. Edited by René J. Dubos, Ph.D., of the Rockefeller Institute. 820 pages. Illus. Price \$8.50, cloth. Philadelphia: J. B. Lippincott Co., 1958.

AN ATLAS OF ESOPHAGEAL MOTILITY IN HEALTH AND DISEASE. By Charles F. Code, M.D., Ph.D., Professor of Physiology, Mayo Foundation; Consultant, Section of Physiology, Mayo Clinic; and Brian Creamer, M.D., M.R.C.P., Jerry F. Schlegel, B.S., Arthur M. Olsen, M.D., M.S., F. Edmund Donoghue, M.D., M.S., and Howard A. Andersen, M.D., M.S., all of the Mayo Clinic and Mayo Foundation. 134 pages. Illus. Price \$8.50, cloth. Springfield, Illinois: Charles C Thomas, 1958.

CLINICAL RADIOLOGY OF ACUTE ABDOMINAL DISORDERS. Bernard S. Epstein, M.D., Chief, Department of Radiology, Long Island Jewish Hospital, New Hyde Park, New York; Associate Clinical Professor of Radiology, Albert Einstein College of Medicine, Yeshiva University, New York. 352 pages. Illus. Price \$15.00, cloth. Philadelphia: Lea & Febiger, 1958.

NEGROES AND MEDICINE. Dietrich C. Reitzes. 400 pages. Price \$7.00, cloth. Cambridge, Massachusetts: Harvard University Press for The Commonwealth Fund, 1958.

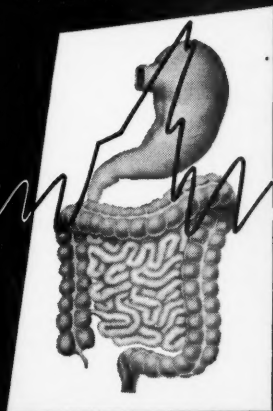
COLD INJURY, GROUND TYPE. Prepared Under Direction of Major General S. B. Hays, Surgeon General, U. S. Army. Editor in Chief, Colonel John Boyd Coates, Jr., MC. Associate Editor, Elizabeth M. McFetridge, M.A. 570 pages. Illus. Price \$6.25, cloth. Washington, D. C.: U. S. Government Printing Office, 1958.

THE ETERNAL SEARCH. By Richard Mathison, staff member of *Los Angeles Times*; former editor of *Fortnight* magazine. 384 pages, including biographical sketches and index. New York: G. P. Putnam's Sons, 1958. Price, \$5.95.

An anecdotal history of the lore and legend of the world's drugs and medicines from primitive times to the present, *The Eternal Search* is organized by drug categories and ailments, rather than chronologically, and pursues the important doctrines of medicine down through the centuries. It traces the origins of old wives' tales and shows how some of their beliefs and superstitions have found their way into modern pharmacy. Words and expressions that originated in the lore of medicine are explained, and even the eternal feuds among doctors, druggists, and grocers are covered.

Mr. Mathison has included in his book descriptions of most of the primitive remedies and the weird and

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wonderful attempts of drug therapy during the Middle Ages. There are chapters on poisons, childbirth, plagues, pain killers, cannibalism and cosmetics. The Eternal Search is filled with tales, passing trivia and notes of interest such as: de-horned unicorns frolicking in green pastures; old Eskimos tramping off when it's time to die; bellowing Vikings being chased by raiding hopheads; well-dried and neatly sliced deadmen on display at drug counters; sick whales and virginal hippotomi; Australian bushmen distilling and drinking their best friends . . . various bathers, bleeders, toothpullers, quacks, popes, peasants, ghosts from all the more respectable religions, barbers, bacteria (kindly and vicious), sick lepers and dead newborns; George M. Cohan's father doing an Irish jig to peddle Indian tonic; cures for colds, drowsy, bedbug bites and 20,000 other ailments; a handy guide for home embalming; tips on the growing narcotics in window pots; several convenient methods to live forever; and—a sure cure for the hiccups.

Richard Mathison describes his book as follows:

"The Eternal Search is not a textbook. It offers no panaceas. It makes no effort to censor the doings of our forefathers. . . . It recounts old lies, gossip, and quackeries as well as truth, facts, and acts of great devotion and integrity. If this volume has any purpose, it is . . . to remind us that our past rules our future. . . . We shall, no doubt, seem as superstitious and strange to generations to come."

The idea for The Eternal Search came to Mr. Mathison while he was browsing in a San Francisco Chinatown herb doctor's shop filled with strange roots, plants and dried animals. It occurred to him then that there might be interest in the meaning of these hoary remedies to modern pharmacy. He started collecting all the material he could gather, browsing through books and medical libraries, looking at news clippings, and talking with doctors, pharmacists, and people who remembered old remedies recommended by their grandparents. The result is The Eternal Search, the first one-volume history of drugs, medicine and the art of the apothecary.

IMMUNIZATION INFORMATION FOR INTERNATIONAL TRAVEL. Prepared by Division of Foreign Quarantine, Public Health Service, Washington, D. C.; Government Printing Office, 1958. Price, 30 cents.

The booklet is designed primarily for use of travelers going abroad and for health departments and physicians. It gives current details on immunization requirements for persons entering the United States, including Americans returning from abroad. It also lists requirements and recommendations for immunization in 200 other countries, and in some cases, additional recommendations of the Public Health Service for American travelers.

Information on bringing pets into the United States from other countries is included in a special section.

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BOARD CERTIFIED RADIOLOGIST (including isotope medallion) seeks association with a hospital group or clinic in the Twin Cities or vicinity. Agrees to interpret office examinations. Address E-656, care MINNESOTA MEDICINE.

WANTED—General Practitioner interested in pediatrics in town 5,000—10,000 population. Group of three doctors at present. Beginning salary \$10,000 with equal partnership planned. Address E-647, care MINNESOTA MEDICINE.

WANTED GENERAL PRACTITIONER—Twin Cities suburban area. New clinic building. Immediate opening. Address E-613, care MINNESOTA MEDICINE.

EXCELLENT OPPORTUNITY for certified or board-eligible pediatrician with established group in attractive Minnesota community. Medical Block Clinic, 412 Main Street, Red Wing, Minnesota.

RESIDENCY TRAINING AVAILABLE—Three-year Board-approved residency in Physical Medicine and Rehabilitation in 1300-bed Veterans Administration Hospital with Baylor University College of Medicine affiliation. Annual stipend: regular residency \$3250-\$4165; career residency \$6505-\$9890 (stipend dependent upon qualifications). Physicians qualified in specialty of PM&R are in great demand within the VA, private institutions of rehabilitation, private hospitals and private practice. Write Manager, VA Hospital, Houston, Texas.

WANTED—General Practitioner with ENT experience in small western Minnesota city to associate with small group. To become full partner in three years. Address E-648, care MINNESOTA MEDICINE.

WANTED—Internist, General Surgeon and General Practitioner with special interest in Obstetrics and/or Pediatrics. Salary on contract basis for one to two years and then eligibility for partnership in a five-man clinic in Minneapolis. Complete clinical facilities with good hospital staff association. Address E-653, care MINNESOTA MEDICINE.

GOLDEN OPPORTUNITY to start a group. Clinic building, equipped, adjoins hospital. Sacrifice 25 per cent list. Terms. Address E-650, care MINNESOTA MEDICINE.

OPENING FOR GENERAL PRACTITIONER—Clinic at St. Croix Falls, Wisconsin, needs young general practitioner for either locum tenens or permanent situation. Please call collect St. Croix Falls, No. 236, or write K. R. Taylor, St. Croix Falls Clinic.

PHYSICIAN WANTED for staff. Veterans Administration Hospital, St. Cloud, Minnesota.

FOR SALE—Retired M.D. offers office furniture and fixtures at attractive price. Call at 2943 Emerson Avenue North, Minneapolis, or telephone JACKSON 9-0303.

EMPLOYERS' SERVICE—A placement bureau for all medical and hospital personnel. Administrators, Educational Directors, Instructors, Anesthetists, Dietitians, Pharmacists, Directors of Nursing, Technical and Executive Personnel. Send for registration form today—tell us *confidentially* about yourself and the position you would like. Write, call or visit with Mr. Dargis, 320 Rand Tower, Minneapolis 2, Minnesota.

FOR RENT—Surgeon occupying spacious new suite of offices, Medical Arts Building, Minneapolis, desires to share quarters on full or part-time basis with one or two physicians in compatible fields of medicine. Reception, consultation and examining rooms adequate to needs of most discriminating practitioner. Address E-654, care MINNESOTA MEDICINE.

FOR RENT—Air-conditioned office space available at 1337 Saint Clair Professional Building, Saint Paul. Off-street parking. Telephone: CApital 2-5885 and Midway 8-3838.

FOR RENT—Unopposed General Practice, completely equipped. One-year trial basis with option to buy possible. Available July 1, 1959. Owner specializing. Address E-652, Care MINNESOTA MEDICINE.

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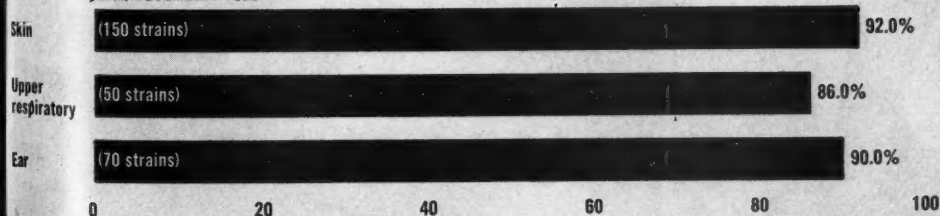
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OCTOBER, 1955-MARCH, 1956



JUNE-DECEMBER, 1953



*Adapted from Royer.¹